

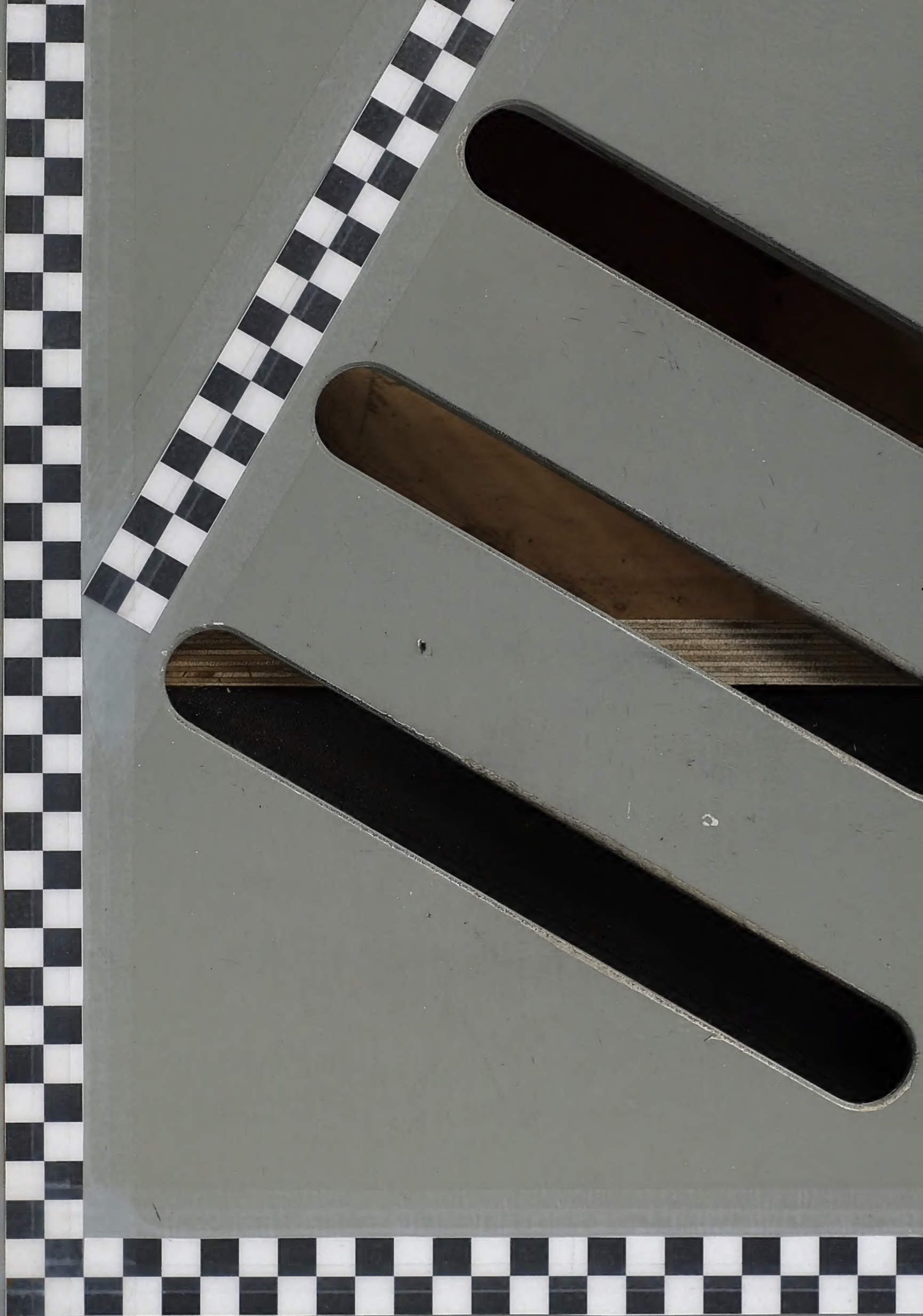
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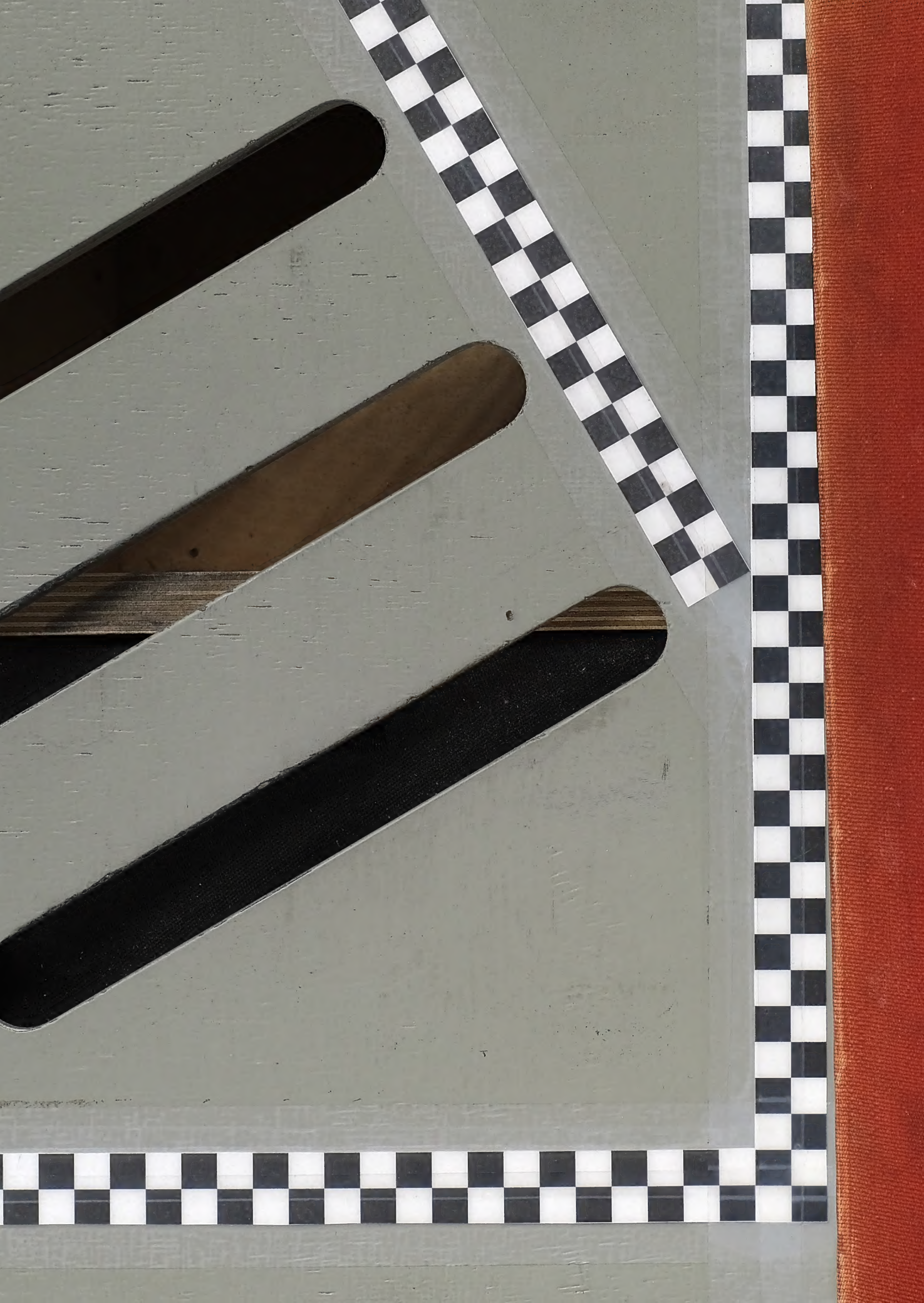




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PEABODY MUSEUM
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MEMOIRS

VOLUME I

CAMBRIDGE, MASS.
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MEMOIRS

OF THE

PEABODY MUSEUM OF AMERICAN ARCHAEOLOGY AND
ETHNOLOGY, HARVARD UNIVERSITY.

VOL. I.—No. 1.

PREHISTORIC RUINS OF COPAN,
HONDURAS.

A PRELIMINARY REPORT OF THE EXPLORATIONS BY THE MUSEUM,
1891 — 1895.

CAMBRIDGE, MASS.:
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EDITORIAL NOTE.

WITH this Memoir is begun a series of publications of quarto size, in order to provide for larger plates than can be given in the octavo "Archæological and Ethnological Papers" of the Peabody Museum.

This preliminary report of the explorations at the Ruins of Copan is intended to give only a general description of the ruins and a summary of the work of the several Museum expeditions to Honduras from 1891 to 1895. It will be followed by special papers relating to discoveries made during the explorations.

The following pages have been compiled from the field notes of Marshall H. Saville, John G. Owens, and George Byron Gordon, who at different times have carried on the explorations under the direction of the Museum.

The compilation of the report was intrusted to Mr. Gordon, who, since the lamented death of Mr. Owens, which occurred at Copan on February 21, 1893, has been in charge of the field work at the ruins.

Previous to the explorations by the Museum, Alfred P. Maudslay, of London, had carried on extensive researches among the ruins of this remarkable prehistoric city, and had begun the publication of his work on the Archaeology of Central America. His elaborate and important memoir has been continued; and free use has been made of it in the preparation of this report. Mr. Maudslay has most heartily coöperated with the Museum in the continuation of the work at Copan, and during the year 1893-94 he was the representative of the Museum at the Ruins. As Mr. Maudslay had given names, with reference by letters and figures, to the various portions of the Ruins and to prominent sculptures, the same designations are given in this report and on the accompanying plan. Additional features have been indicated by continuing in sequence the letters and figures, thus avoiding duplication and confusion.

The accompanying plan of the principal part of the Ruins is from a survey by Mr. Gordon, who made the drawings for several of the illustrations in the text. Other illustrations are from drawings by C. C. Willoughby, who has also assisted in the preparation of the report.

This important research at the Ruins of Copan has been made possible by the generous contributions of the patrons of science whose names are given in the following list.

F. W. PUTNAM,
Curator of the Peabody Museum.

CAMBRIDGE, MASS.,
June 1, 1896.

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THE AMERICAN MUSEUM OF NATURAL HISTORY OF NEW YORK

COÖPERATED IN THE EXPEDITION OF 1894-95.

EXPLORATION OF COPAN.

GENERAL DESCRIPTION OF THE SITE.

WITHIN the territory of Honduras, about twelve miles from the frontier of Guatemala, in a beautiful valley watered by a rapid, winding stream, and shut in by mountains that rise in ridges to a height of three thousand feet, are situated the Ruins of Copan (lat. $14^{\circ} 51' 30''$). The only roads leading to the ruins are rough mule-tracks over the mountains; the shortest route from the Atlantic coast is that from Yzabal, crossing the mountain ranges of Mico and Espiritu Santo, between which the river Motagua flows in a circuitous course to the sea.

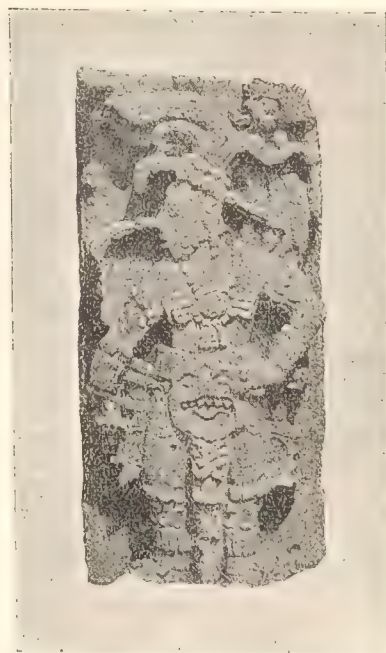
After leaving Comotan, the last town within the territory of Guatemala to which the account given by Stephens in 1839 applies to-day, the road crosses the river Copan on its way to join the Motagua and ascends a mountain ridge, from whose summit glimpses can be caught of the stream, winding in and out between precipitous banks, tumbling over ledges and leaping among the rocks, a perfect cataract, not navigable even to the lightest canoe. The road reaches a height of 2,800 feet, and then descends abruptly into the Copan valley, which has an elevation of 2,000 feet above the sea. The upper slopes of the surrounding mountains are covered with open pine forests, but the foot-hills and the plain of the valley are clothed in an impenetrable thicket of low trees and brush.

Stephens states that at the time of his visit, in 1839, the whole valley was buried in a heavy forest. Monkeys stared at him from the branches of the trees, and passed to and fro high above his head. To-day there are no monkeys in the vicinity, and the deep, gloomy forest where they like to roam is wanting.

According to information obtained from the oldest inhabitants of the modern village of Copan, the forest of gigantic trees that clothed the place in Stephens' day was cut down about thirty years ago by a colony from Guatemala who came to plant corn and tobacco in the fertile lands of the valley. They left the trees that grew on the higher structures of the ruins, making a picturesque grove, a remnant of which still remains, a few cedars and ceibas of gigantic proportions, clustered about the ruins of the temples,

shrouding them in a sombre shade, and sending their huge roots into the crevices and unexplored chambers and vaults and galleries of the vast edifices.

The valley in which the ruins are situated has the form of a level plain, about one and a half miles wide and seven or eight miles long, enclosed on all sides by the mountains, which rise in gentle slopes in front, and farther back in more precipitous ridges terminating in rounded peaks and level table-tops. The river flows in a southwesterly direction. It emerges by a narrow passage from the mountains, flows with many windings through the plain, and disappears through a gorge to the west. The principal ruins are situated on the right bank near the centre of the valley, where the river runs close to the eastern foot-hills. Taking an abrupt bend to the west, the river flows directly against the ruins, by which its course is again turned abruptly to the south. As would be expected in a level valley like that of Copan, the river is constantly changing the position of its bed. For a long time it has been making encroachments on the ruins, and the entire eastern side of the great pile known as the Main Structure has been carried away by it, leaving the interior exposed in the form of a cliff one hundred and twenty feet high. The whole of this elevation is artificial; pieces of pottery and obsidian knives can be picked out of it even at the water's edge. The river is subject to annual freshets, during which an immense body of water is thrown with great force directly against the opposing cliff, from whose face a fresh portion falls in each succeeding year. So swift is the current that little of this fallen material is left when the water subsides.



SCULPTURES FROM TERRACE EAST OF THE GREAT PLAZA. (See page 24.)

HISTORICAL SKETCH.

COPAN has been visited in former times by several travellers and explorers who have given more or less accurate information respecting what they saw.

In 1530 Hernando de Chaves made an expedition into the neighborhood, from the capital city of Guatemala, and conquered an Indian stronghold called Copan; but neither he nor any of his associates on the expedition left any account, so far as is known, of the people or towns.

The later historians of the country have made an attempt to identify the place called Copan, conquered by Chaves, with the ruins which since their first mention have been known by that name; but there is nothing within the range of our present knowledge of the facts to justify such a conclusion. There are, on the contrary, historical evidences which seem to prove almost beyond a doubt that the place conquered by Chaves was very inferior to, and more modern than, the ruined city called Copan, to-day, concerning which history is silent. It is now the general opinion of students that this city of antiquity was a complete ruin long before the arrival of the Spaniards; all tradition concerning it was lost, and its name forgotten.

In 1576 Diego Garcia de Palacio, Justice of the Royal Audiencia of Guatemala, travelling in accordance with his duties, passed through the ruins, and in a letter to King Philip II. of Spain gives a description of what he observed. This document, which is preserved in the Muños collection of Spanish manuscripts in the British Museum, is of great value,—containing as it does the only mention made by the early Spanish writers concerning these ruins. Palacio describes what he saw as “ruins and vestiges of a great population and of superb edifices, of such skill and splendor that it appears that they could never have been built by the natives of that province.”* After a description that corresponds very well so far as it goes with what is seen to-day, he goes on to say: “I endeavoured with all possible care to ascertain from the Indians, through the traditions derived from the ancients, what people lived here, or what they knew or had heard from their ancestors concerning them. But they had no books relating to their antiquities, nor do I believe that in all this

* A letter from the Licenciado Diego Garcia de Palacio to Philip II. of Spain; dated Guatemala, 8th March, 1576. Maudslay's translation.

district there is more than one, which I possess. They say that in ancient times there came from Yucatan a great lord who built these edifices, but that at the end of some years he returned to his native country, leaving them entirely deserted." *

Here is an account written only forty-six years after the expedition of Chaves, and yet, from the words used, it is plain that the structures were in an advanced state of ruin. Palacio is known to have been an intelligent and faithful inquirer after historical facts, and yet the only story he was able to get from the natives was of the vaguest possible character, and sounds more like their own invention than a real tradition.

If the place had really been destroyed by Chaves, there must have been eyewitnesses of the event still living at the time of Palacio's visit. It is conceivable that the Indians might have invented the story they gave him in order to avoid telling the truth, but it is scarcely possible that Palacio could have been so deceived.

From the time of Palacio's visit until the year 1835, a lapse of more than two centuries and a half, the ruins remained in total darkness, buried in the depths of a tropical forest, and unknown except to the indifferent natives, — so that the historian Robertson, writing in 1777, quotes the statement made to him that in all New Spain there is not "any monument or vestige of any building more ancient than the Conquest." † The report of Colonel Juan Galindo, who was commissioned by the Government of Guatemala in 1834 to examine the ruins, has never been published in full; but a letter written by him to the editor of the "Literary Gazette" of London, is printed in that Journal for 1835, and a similar letter is printed in the "Transactions of the American Antiquarian Society," Vol. II. These letters, although they make the ruins known for the first time to the civilized world, add little to our knowledge of Copan.‡

It remained for Mr. John L. Stephens — who in 1839 was sent on a special commission to Central America by the President of the United States, and who, in his "chase after a government," improved his time by exploring

* See Appendix for Squier's reprint and translation of Palacio's letter.

† Robertson, *History of America*, vol. II., note lviii to p. 298. In the same note, however, he refers to information received of a temple near Cuernavaca, composed of large stones fitted nicely to each other.

‡ There is an account of the Ruins of Copan in a manuscript history of Guatemala written in the seventeenth century, and preserved in the City of Guatemala. It is entitled "Historia de Guatemala: Recordacion Florida, escrita el siglo xvii," by Francisco Antonio de Fuentes y Guzman. The account of Copan here given is quoted by Juarros in his history of Guatemala (*Compendio de la Historia de la Ciudad de Guatemala*, por El Señor Don Domingo Juarros. Guatemala, 1808); but from its erroneous and absurd character, and the fact that it is directly contradicted by what has been described by other writers and by what is seen to-day, it seems evident that it could never have been written from personal knowledge. The writings of Fuentes must be regarded as of little value.

the antiquities of the country, — to awaken the general interest of the scientific world concerning the ruins.

Stephens was so fortunate as to have with him an English artist, Fred. Catherwood, whose pencil drawings, executed with most admirable fidelity, add greatly to the archaeological value of Stephens' work.* Owing to the dense tropical forest that hid the ruins in his day, the plan as well as the description by Stephens is of necessity incomplete, and in many particulars erroneous; he fell into an error, that would seem to have been made by Palacio nearly three hundred years before, in mistaking fallen buildings for ruined city walls, and in denying the existence of interior chambers and stone-roofed structures.

The real character of the principal structures was first understood by Mr. Alfred P. Maudslay of England, who prepared the first map of the ruins having any claims to exactness.

In 1885 Maudslay visited the ruins and made the first attempt at an extensive and careful exploration. Having brought tools for excavating, and materials for taking impressions of the sculptured monuments, he made a number of excavations among the ruins, and took with him to England a set of moulds of the principal monuments from which casts have been made and exhibited in the South Kensington Museum and in the Archaeological Museum at Cambridge.

The result of Maudslay's work, so far as relates to Copan, has now been given to the world in a form which makes it at this date the most valuable contribution to the archaeology of Central America.†

In 1889 Mr. E. W. Perry obtained from the Government of Honduras a concession with the object of founding a National Museum of Antiquities at Copan, to be under the management of a Society of Antiquarians, of which Mr. Perry was to be permanent president. The scheme involved the exploration of the ruins of Honduras and the disposition of the collections thus obtained in a Museum at Copan. The plan was never realized; and in 1891 Mr. Charles P. Bowditch, of Boston, obtained from Mr. Perry all the rights pertaining to him through the above-mentioned concession, in the interest of the Peabody Museum of Archaeology and Ethnology of Harvard University. The scheme outlined in this concession proved unsatisfactory, and a plan of operations was proposed to General Luis Bogran, then President of Honduras, by which the interests of science would be better served, and which President Bogran, with a praiseworthy zeal for the promotion of scientific research, readily agreed to. The result was an edict of the Government of Honduras by which the Peabody Museum acquired the care of

* Incidents of Travel in Central America, Chiapas and Yucatan. By John L. Stephens. 1841. 2 vols. 8vo.

† Biologia Centrali-Americana, edited by F. Ducane Godman and Osbert Salvin. Archaeology by A. P. Maudslay. Parts I. to IV. London: R. H. Porter.

the antiquities of that country for a period of ten years, with the right of exploring the ruins and taking away one half of the objects found in the excavations. The Peabody Museum thus acquired an unprecedented opportunity for making the investigations, so long delayed but of such vast importance, that are needed to throw light on the early inhabitants of the American continent.

It was proposed to send an expedition to Copan each year to remain during the dry season; and for this purpose a committee was appointed, consisting of Mr. Charles P. Bowditch, Mr. Francis C. Lowell, and Professor F. W. Putnam. The committee is indebted to Mr. Maudslay for valuable suggestions, which from his experience in exploring Central American ruins he is in a position to give, and through him also were obtained the services of skilled workmen who had been his assistants in making copies of the monuments.

The first expedition left Cambridge in October, 1891, in charge of Mr. Marshall H. Saville and Mr. John G. Owens, who had been Professor Putnam's assistants in the Museum, and under him had acquired a training that made them well fitted for the work. Being prevented by his duties from leaving Cambridge himself, Professor Putnam directed the operations in the field by letters of instruction. The expedition was thoroughly equipped with tools for making excavations, and with materials for taking photographs and impressions of the monuments and other sculptures. Important results were obtained by the first season's work, which are referred to in the summary given further on.

The second expedition left in October, 1892, in charge of Mr. John G. Owens as director of the expedition and also as a special commissioner for the World's Columbian Exposition. Mr. Owens took with him Mr. G. Byron Gordon as surveyor, and Mr. Edmund Lincoln and Mr. George Shorkley as assistants. Seldom has an archaeological expedition gone to the field with such brilliant prospects or under so energetic and enthusiastic a leader.

The party arrived at the ruins on the 1st of December, and for the first two months the work went on very satisfactorily. The principal part of the ruins was cleared of brush; a survey was being made; moulds were made of all the monoliths that had not been moulded in the previous year; several excavations were begun which gave most important results, and arrangements were made for obtaining moulds of the great monoliths of Quirigua, in the coast region of Guatemala. It was to make these arrangements that Mr. Owens made a journey to the coast towards the end of January. Two days after his return he fell violently ill with a malignant fever of the country, and notwithstanding the efforts of a mind naturally cheerful, a constitution always robust, and a spirit never daunted to cope with the violence of the disease, he grew steadily worse, and

died on the 17th of February, after twenty-one days of suffering. He was buried at the ruins, beside one of the great monoliths in the plaza.

Mr. Gordon then took charge of the work and carried out, so far as possible, Mr. Owens' plans. Don Carlos Madrid, as representative of the Honduras government, was sent to Copan to take part in the division of the objects found; and those constituting the Museum's share were transported to the coast and shipped to Cambridge. The moulds of the Quirigua monoliths were completed, and from some of them casts have since been made.

In the winter of 1893-94 Mr. A. P. Maudslay went to Copan, as the representative of the Peabody Museum, and while there made several excavations, and brought back a number of moulds. In October, 1894, a fourth expedition was equipped, and Mr. George Byron Gordon was appointed director. He arrived at the ruins in December, and was joined in March by Mr. Robert Burkitt, who was sent out with supplies. The party remained in the field until the end of June, 1895.

The route taken by these expeditions has been as follows:— From New Orleans to Livingston in Guatemala, by the steamers of the Royal Mail line; from Livingston to Yzabal by the steamer of the Rio Dulce Navigation Company; and from Yzabal to Copan by mules over the same route as was followed by Stephens in 1839. At Yzabal the members of each expedition have been placed under deep obligation to Mr. and Mrs. T. J. Potts, the only American people living at that place. Mr. Potts, from his intimate knowledge of the country, acquired during a residence of over thirty years, and from his interest in its antiquities, as in all matters relative to scientific research, has been able to render most valuable services, and the Museum has been glad to avail itself of his kind co-operation. The members of these expeditions will always cherish the memory of those happy occasions at his hospitable board, when, after long and weary journeyings and months of hardship and exposure, they were made so welcome there, and so tenderly cared for by the kindest of hostesses, Mrs. Potts.

In Livingston valuable services were rendered to the first expeditions by Mr. John T. Anderson, who was then Consul of the United States at that port. The later expeditions are greatly indebted to Mr. William Owen, manager of the Northern Transportation Company at Livingston, and also to Mrs. Owen, who extended such kindly hospitalities to the members of the expeditions as to win their lasting gratitude.



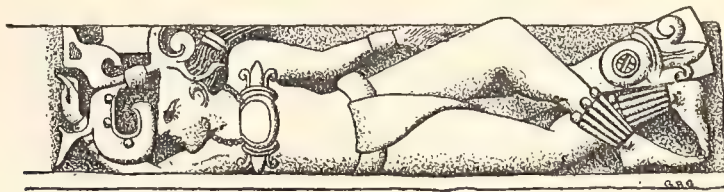
GARGOYLE (SERPENT'S HEAD) FROM DÉBRIS OF TEMPLE. See page 19.

PLAN OF OPERATIONS.

It is the object of the Peabody Museum to preserve the ruins from the injuries to which they have been subjected in the past, and from which they have suffered greatly since Stephens' day. The chief source of these injuries is in the indifference of the natives, who, attracted to the valley by its fertility, do not hesitate to break up a structure or monument to get material for their fences and houses. The monuments have suffered also from fires built near them by the natives in burning brush. To prevent further destruction from these and similar causes, a stone wall has been built around the principal group of ruins, and they have been placed in the charge of a keeper, Captain Don Juan R. Cueva, the faithful companion of the exploring parties, who, in this capacity, resides at the ruins throughout the year.

The rainy season at Copan begins about the middle of June, and lasts till the end of December. During the intervening months the excavations cannot be successfully carried on. The season opens with a series of violent thunder-storms, which continue with increasing recurrence until the end of July, when the rains become less violent, but fall constantly. During the months of March, April, and May the heat is intense during the middle of the day, but the mornings and evenings are cool and pleasant.

The plan of operations adopted in the field is as follows: The whole area on which any remains are found has been divided into square sections. Before a detailed examination is begun on any particular group of ruins or locality, it is carefully surveyed and located on an outline map of all the ruins. Each group of structures is in this way assigned to its proper place on the map, which will thus represent with absolute exactness the whole site of the city, with the shape and character of its structures, as well as the natural topography of the valley. If the group consists of buildings, they are entirely cleared of debris, and then carefully measured and drawn upon an enlarged plan of its corresponding section. Wherever sculptured monuments or hieroglyphic inscriptions are found, they are both photographed and moulded in paper or plaster, to be reproduced in the Museum at Cambridge for further investigation and study.



RESTORATION OF SCULPTURE ON A STEP OF HIEROGLYPHIC STAIRWAY. (See page 22.)

DETAILED DESCRIPTION OF THE RUINS.

THE plan (Plate I.) shows the central group of ruins and the contiguous parts. The nomenclature of the different parts so far as given by Maudslay has been adopted. The principal ruins are grouped about what has been called the Main Structure (Plate II.), a vast irregular pile, rising from the plain in steps and terraces, and terminating in great terraced elevations each topped by the remains of a temple. (See plan, 11, 16, 20, 21, 22, 26.) The summit of the highest of these is about a hundred and thirty feet above the level of the river. Of the temple* with which each of these elevations was crowned only the foundations and parts of the lower walls now remain in position. The place where each stood is a heap of fragments, and the slopes of the pyramids and the terraces and pavements below are strewn with the ruins of these superb edifices. The walls of the buildings and the outer casing of the pyramids and terraces are built of stone, neatly cut in flat-faced oblong blocks, and laid in parallel rows, occasionally with mortar, but generally without. All these stone walls and casings appear to have been plastered, and the plaster decorated with paintings; but only slight traces of these remain.

Little attention seems to have been given to breaking joints in the stone work; and while generally some care seems to have been taken to prevent the joints in contiguous rows from falling together, no definite system of breaking joints was adhered to. This is rather surprising when we consider the nicety with which the blocks were cut, and the perfect regularity of the rows. The slopes of the pyramidal foundations are built in terraces about five feet high and five feet broad, or in steps consisting of single or double rows of stones, the step or terrace being generally, if not always, covered on top with a layer of mortar cement.

The interiors of all the raised foundations and pyramids, so far as known from excavations made, are filled with rough stones and clay, which show signs of having been very carefully laid for solidity and strength. It is not unusual to find in the interior of the pyramids a second casing, or at least secondary walls and terraces; but whether these form in any instance complete interior casing, or whether they are confined to one side or part of a side, has not been determined. The question of their meaning has been

* The same number is used to designate a mound or the temple on its summit.

complicated by the discovery of similar walls below the foundations of some of the pyramids. These underground walls can best be seen on the river front (Plate II. 1) where the face of the exposed cliff formed by the action of the river presents patches of faced wall more than half-way down. It was probably the existence of these walls that led to the erroneous belief in what has been called the great wall of Copan.

Mr. Maudslay seems to have been of the opinion that the object of these interior walls was to strengthen the structure and bind it together. But the conditions under which they are found seem to preclude this theory from general application, although it may very well apply to particular cases.

Mr. Owens, who gave a good deal of attention to the problems presented by the river front, was inclined to believe that these underground walls marked different stages in the development of the structure, and were in fact the remains of older buildings that had been occupied for a time and abandoned in the gradual building up of the great complex structure to its ultimate form. The cause of this abandonment of buildings now beneath the foundations of others can be readily ascribed either to the changing tastes and requirements of the people or to the pride of rulers for whose glorification the works and dwellings of their predecessors had to be sacrificed to give place to temples in their honor. There is some actual evidence in the condition of the buildings, as we find them on the surface, to support the theory of a gradual alteration in the shape and size of the buildings: Temple 50 was built against the side of Pyramid 16, its wall resting on the terraces. In the eastern end of Temple 22 a doorway was found walled up. Two lower chambers in Temple 20 were found filled with clay and rubble, and their doorways closed by walls. All this would seem to indicate a gradual addition of new features accompanied by abandonment of older parts. It can readily be seen how a process of this kind carried on for centuries, without any well-designed plan to adhere to or any definite idea to carry out, would result in a great complex mass of structures like that of Copan to puzzle and perplex the explorer.

There are other evidences that point to several successive periods of occupation. The river front presents what looks like at least three great strata, divided by floors or pavements of mortar cement. If these floors mark the various levels corresponding to different epochs in the history of the city, the question of the age of the ruins becomes still more complicated; for between each successive period of occupancy there is the period of silence, the length of which can only be inferred from the thickness of the superimposed stratum. The questions thus raised by the results of the first investigations can only be settled after extended exploration and study.

In the interior of the Main Structure are two enclosed courts, their floors, paved with mortar cement, being sixty-five feet above the level of the river. One of these, the Eastern Court, is entered from the south by a narrow passage, between Mounds 16 and 18, formerly closed at its southern end by a thick wall, now broken down in the centre. The sides of the court are built up with solid stone-work in seats or terraces as in an amphitheatre. About the centre of its eastern side the terraces have been torn away and a deep pit made underneath, revealing the end of a tunnel which leads to the vertical face of the cliff overhanging the river. This pit also gives access to a small chamber directly beneath the inner end of the tunnel. The following is quoted from Maudslay (page 31):—

“Palacio in his description mentions the ‘two caves or passages’ the openings of which can be seen on the face of the river-wall, and which have given to the ruins the name of ‘Las Ventanas,’ or ‘The Windows.’ . . . The floor of the passage is level, and the interior is faced with stone, and is just large enough for a man to crawl through. The top of the passage is a little below the level of the court; it was closed on the land side, and I think not intended again to be opened. A deep pit was dug here by Colonel Galindo, shown in the plan, which now gives access to the passage.

“A few feet from the end of this passage, but at a greater depth below the level of the court, is the subterranean vault, . . . which was broken into by Colonel Galindo. The vault and passage do not seem to have had any connection with one another. The following is Galindo’s description of his discovery:—

“‘Through a gallery scarcely 4 feet high and $2\frac{1}{2}$ feet broad one can crawl from this square through a more elevated part of the temple overhanging the river, and have from the face of the precipice an interesting view. Among many excavations, I made one at the point where this gallery comes out into the square. I first opened into the entrance of the gallery itself, and digging lower down I broke into a sepulchral vault whose floor is 12 feet below the level of the square. It is more than 6 feet high, and 10 feet long, and $5\frac{1}{2}$ feet broad, and lies due north and south, according to the compass. It has two niches on each side, and both these and the floor of the vault were full of red earthenware dishes and pots. I found more than fifty, many of them full of human bones packed in lime; also several sharp-edged and pointed knives of *chaya* (a brittle stone called *itztli* by the Mexicans), and a small head, apparently resembling death, its eyes being nearly closed and its lower features distorted. The back of the head is symmetrically perforated by holes; the whole is of most exquisite workmanship, and cut out or cast from a fine greenstone, as are also two heads I found in the vault, with quantities of oyster and periwinkle shells brought from the seashore in fulfilment of some superstition. There were also stalactites taken from some caves. All the bottom of the vault was strewn with fragments of bones, and underneath these a coat of lime on a solid floor.’

“There is another similar passage lower down the cliff and further to the north. We made a ladder and succeeded in entering this passage and crawling to the further end, which we found closed with a stone wall. It is about the same length as the first passage described.”

On the plan (Plate I.) the tunnel is indicated by dotted lines, and the vault is shown in the same way in its place beneath the terraces, which are shown continuous above the vault, and not broken as they are at present.

All the accounts of this tunnel contain several errors. Its real dimensions are: Height, 3 feet; breadth at bottom, $2\frac{1}{2}$ feet; length, $65\frac{1}{2}$ feet. The floor is not level, but has a downward slope toward the river of about three feet in the whole length, the floor at the inner end being on a level with the floor of the court.

The following description of the tunnel is from Mr. Owens' field notes:

"The walls of this passage are built of well-dressed stones of the same kind as had been used for building purposes throughout the ruins. In the construction of the tunnel a foundation of three rows of stones cemented together was first laid, the stones of the central row being flat and undressed and of greater length than the stones forming the row upon either side which support the side walls of the tunnel. Throughout nearly the entire length of the passage each side wall, up to the spring of the arch, consists of four courses of stone of nearly equal thickness. At the western end of the passage, however, but three courses of larger stones are employed, and the south wall at this point begins with only two courses, one large stone taking the place of two. The south wall changes from three to four courses, $8\frac{1}{2}$ feet from the west end. A corresponding change in the north wall takes place 15 feet from the same end. The arch springing from the side walls is of the horizontal type, and there is nothing peculiar in its construction.

"All the side stones are laid in cement, but I could not see that their surface had ever been plastered, or that any cement had been used to secure the cap-stones which consisted of large flat stones about a foot thick, and long enough to reach almost to the outer edge of the widest side walls.

"The floor of the passage was of cement, slightly convex and about three and a half inches thick midway between the walls.

"The central row of stones forming a part of the foundation has been removed for the distance of seventeen feet from the east end, and only eleven feet of the cemented floor at the western end of the passage is in place."

Maudslay's authority for the statement that the tunnel was closed at the inner end (or land side), and not intended to be opened again, is not apparent; but he probably derives it from Galindo's statement that he "first opened into the entrance to the gallery itself," which therefore must have been closed previous to his excavation. This was undoubtedly the case; and the lower row of stones forming the first seat or terrace rising from the floor of the court still remains. It is, however, by no means certain that a smaller aperture did not connect the shaft with the court at a higher level. A case apparently of this kind exists in the second tunnel referred to by Maudslay. This is some distance farther north and lower down, and is thus described by Mr. Owens:—

"As we found it, this tunnel was open about 40 feet, the end being closed by rough stones imbedded in cement. Small boys were employed to enter and remove the filling. As the cement was very hard, the work progressed very slowly; but after following the side walls for about fifteen feet they were rewarded by coming to the end of this filling, and for 65 feet beyond the tunnel was practically empty. The entrance to this inner part was scarcely large enough for a man to crawl through, being only 17 inches wide and 13 inches high. The width remained the same throughout the entire length; but the height and character of the roof changed remarkably, and there was a constant downward slope toward the river. At one place what appeared to be a triangular watercourse came down through the roof at an angle of 30 degrees. On the floor were found a few potsherds, some bone needles, jade beads, and shell ornaments. This inner end of the tunnel is about 115 feet from the face of the cliff, and about 40 feet below the surface. I am not able to say positively for what it was originally intended, but it was probably a watercourse, as its floor is level with what seems to have been an old plaza now buried 40 feet below the surface."

Directly opposite the pit dug by Galindo, on the western side of the court, is the stairway referred to on page 29 and figured on page 17 of Maudslay's work, and called by him the Jaguar stairway. A broad flight of steps leads to a narrow platform. At a short distance from either end is a large figure of a jaguar, rampant, as is supposed by Maudslay, inserted in the wall. Above the platform two steps extend the entire length of the court, and above these a narrow stairway of six steps leads to the elevated platform that separates the eastern court from the western. In the centre of this stairway is a structure carved on the face into a huge dragon's or serpent's head, holding in the extended jaws a large grotesque human face.

Upon the platform above is what looks like the stone foundation (25) of an oblong building, but there are no signs of any building having stood upon it. To the west of this, directly above the Western Court, are the ruins of a building, close to the eastern wall of which is Sculpture Z, discovered in April, 1893. At a short distance to the south, close to the side of Pyramid 16, are the remains of a building (50), explored by Saville and Owens in 1891-92.

The following account of this building (Plate III. 1) is taken from Mr. Saville's report:—

"Two mounds are represented on Maudslay's map, but before excavation they presented an L-shaped mass of earth and cut stones at the base of the pyramid. The part which is called the eastern wing extends from east to west at the base of Pyramid 16, and looks more like a mass of debris, fallen from the building above, than the remains of a separate structure. The western wing extends north from the western end of the eastern wing, running parallel with, and close to, the edge of the terrace above Stela P in the Western Court.

"The trees were first felled and burned, and the mound was cleared of the mass of stones on the surface which were then thrown down the terrace into the southwest

corner of the Eastern Court, and thence carried to the southern end of Mound 18 and thrown into the river. The same plan was adopted with the earth, which was carried away in wheelbarrows.

"The eastern wing proved to be a building consisting of two rooms, $24\frac{1}{2}$ feet long and 17 feet wide. The southern or back wall rests on one of the terraces of Pyramid 16. The northern wall, 2.4 feet in thickness, through which a doorway 6.25 feet in width gives access to the first chamber, is almost destroyed, only the base stones remaining in place. The eastern and western walls are about 2 feet in thickness.

"The northern chamber is 20 feet 6 inches long and 5 feet 8 inches wide. Its floor is raised by a single step in the entrance to a height of 1 foot above the pavement outside. In either end of the chamber small niches, about 2 feet in width and about 3 feet above the floor, had been left in the walls. In the centre of the southern side a doorway 7 feet wide gives access to a second chamber, whose floor is raised 9 inches above the floor of Chamber 1. Chamber 2 is of the same length as that of the first room, and $6\frac{1}{2}$ feet wide. In the eastern wall is a niche 2 feet 10 inches above the floor and $2\frac{1}{2}$ feet wide. Above the floor of the niche, which is cemented to a depth of 2 inches, the wall is destroyed. In the western wall is a niche 2 feet 1 inch above the floor; this is 2 feet 1 inch wide, 1 foot 7 inches high, and 10 inches deep.

"A few fragments of animal bones were found resting on the cement in this niche.

"The height of the terrace of Pyramid 16, on which the southern wall of the building rests, above the floor of Room 2, is 2 feet 9 inches, and is covered with $4\frac{1}{2}$ inches of cement, making a total height of 3 feet $1\frac{1}{2}$ inches. It has a slant of 4 inches from the base.

"The height of Chamber 2, from the floor to where the roof-stones begin, is 6 feet 3 inches. The western wall of the room, at present, is 5 feet 8 inches in height. Adjoining the western wall of this building there is a single chamber, the southern wall being built against and partly resting on the terrace of Pyramid 16. This Chamber 3 is 11 feet 9 inches long and 5 feet 7 inches wide. The doorway is 3 feet 9 inches wide, and the northern wall is 1 foot 7 inches in thickness.

"In the southern wall are three niches 2 feet 8 inches from the floor; they average 2 feet in width, 1 foot 7 inches in height, and are 1 foot 4 inches deep at the base, and 3 inches deeper at the top, owing to the slant of the terrace against which the lower part of the wall is built.

"In the western end of the room are two ledges running the width of the chamber. The first is 2 feet 10 inches high, and 1 foot 3 inches wide; the second is 3 feet above the first, and is of the same width; both are covered with cement. The wall against which these ledges are built is 3 feet 3 inches in thickness. The stones of the roof at the western end of the chamber are still in position, but are somewhat sunken, the height from the floor to the base of the capstone being about eight feet. The top of the roof at the northwestern corner is still intact; it is covered with two inches of cement, and is 9 feet 3 inches above the floor of the chamber.

"The western wing is 38.5 feet long, and consists of a single chamber, with an entrance about 10 feet wide on the east. In the doorway two steps lead down to a platform or terrace 5.50 feet wide, running the whole length of the front; a flight of four steps leads from the platform to the pavement below. The walls of the chamber are nearly all destroyed; in the southern end the floor is raised 2.5 feet. The

northern wing seems to have been built later than the eastern. All the floors in this building are made of mortar cement.

"The sculptures found in the digging were few and unimportant. In the chamber between the two wings were found a small shallow bowl, a fine chalcedony spear-point, two broken obsidian spear-points, a few obsidian knives and flakes, some fragments of polished bone, and a small pottery face. No lintels of any kind were found about the doorways, and there was nothing to indicate the purpose for which the rooms were used."

From the elevation on which this structure is built, the Western Court is reached by a fine flight of steps of solid masonry, well preserved (15). At a short distance to the south of this stairway, in the Western Court, stands Stela P, facing the west; Catherwood's drawing of this face is given opposite page 140, Vol. I. of Stephens' "Incidents of Travel in Central America."

Farther south, at a few feet from the base of Pyramid 16, is Altar Q. This is described by Stephens, pages 141-2, Vol. I., with reproductions of Catherwood's drawings. Directly west from this is a flight of steps, with a plain circular stone at its base, ascending the raised platform (13), on which are strewn some broken fragments of sculpture and a quantity of loose building stone. At the southern end of this court is the structure designated 14, partly explored by Maudslay in 1885, and again by Saville and Owens in 1891-92. It resembles the foundation of a building, but does not seem to have supported a building of any kind. In front of its northern wall is a platform raised in three steps, running nearly the entire length of the structure. Two circular blocks of stone, each pierced by a hole in the centre, are placed symmetrically at either end of the platform; their use is not apparent, but they may have been used to support poles for an awning. On the north side of the mound, opposite the corners, are large flat slabs, each with an inscription around three sides. They are now displaced and broken. A number of loose sculptures, which are described by Maudslay (pages 23 and 24), are lying about the floor of the court.

Directly above Altar Q on the slope of Pyramid 16, the stairway by which the slope is ascended is divided from the twentieth step by a raised structure formed of large steps having, in high relief in front, rows of what have been called "death's heads." They look like the skulls of monkeys, as Stephens suggests, bare of flesh but with the eyeballs glaring in their sockets.

Maudslay made an excavation into the top of the mound where the temple stood, and found portions of the walls of a lower chamber, and part of a stairway which led to upper chambers of which nothing remains. Among other sculptures lying in the interior of the chamber mentioned, Maudslay describes (page 25) "a number of small human and grotesque heads" which "formed the ornaments of a cornice round the wall about seven feet above the cement floor."

From the Western Court a passage or gateway leads into the narrow court just south of Pyramid 16. On the right hand are the remains of some long stone houses, and directly back of these the terrace terminates in the southern slope of the Main Structure, broken by the terrace on which is Mound 29. This terrace forms the southern termination of the Main Structure. An inclined plane (42) leads from it to the ground below, which is covered with the remains of stone houses. From the passage-way leading to the Eastern Court, a steep flight of steps leads to the terrace (17), bounded on the east by a long range of steps or seats leading to another terrace, which terminates in the irregular contour of the cliff at a height of a hundred feet above the river. On the northern half of this terrace there still remains part of a building (19), most of which has fallen down the face of the cliff. Still farther north are the remains of a high tower or temple (20), partly explored by Maudslay. A portion of it has fallen away into the river below, and the remainder overhangs the very brink of the precipice. Maudslay, on pages 26-27, gives the following account of his discoveries at this point:—

“This line of tumbled stones (No. 19) I examined with great care, and was successful in making out that it was the remains of a row of houses which had extended nearly the whole length of the terrace, the greater part of which had fallen away into the river below. At the north end of this row of houses, there stands, facing the Eastern Court, another raised foundation (No. 20), which supported the most curious building the excavations brought to light,—no doubt the same building which Palacio describes as a tower. Such a mass of stone had fallen down into the court below, that the stone slope and steps leading up to the building were completely hidden. On the side towards the river, traces of a wall were found almost overhanging the cliff, which here measures 107 feet in height from the level of the river.”

“The central doorway is approached from the Eastern Court by a flight of steps; on each side of the doorway a platform or terrace 9 feet wide runs in front of the building; 7 or 8 feet inside the doorway, another flight of steps commences and runs through to the back wall of the building, rising about 14 feet. At the distance of 4 feet 9 inches from the back wall, other steps turn to the north, and lead up to a narrow landing which gives access to what seems to have been an upper chamber; only a small portion of the surface of the wall and the cement of the floor of this chamber can now be traced. The stairways were covered by parallel-laid stone vaults. . . . The most curious feature of this building is the existence of chambers which have been purposely blocked up before the ruin commenced. . . . I cleared out the rough blocks of stone and earth which filled up the lower chamber on the south side of the steps, and found the walls and cement floor almost perfect. The front wall was pierced 3 feet above the floor by two narrow slits 6 inches wide, which appeared to extend to the top of the wall, in which were found some fragments of rough pottery. It did not appear as if this chamber had ever been roofed in. I did not remove the stones at the opening towards the stairway, as these had been built up into a faced wall, and still supported some of the roof-stones of the

ruined vault over the steps. In the same way the steps leading to the upper chamber had been blocked up, and the faced wall used as a support for the vaulting. . . . The only suggestion I can offer in explanation of this state of things is that the builders were not satisfied with the stability of the parallel-laid vaulting over such a large space, and had sacrificed the chambers in order to strengthen the roof over the stairway.

"Projecting from the wall on each side of the steps were two grotesquely carved heads, which probably supported a rope from which a curtain was suspended. . . .

"A large mass of broken sculptured stones lying near to or buried in the rubbish surrounding this building shows how elaborate its exterior ornamentation must have been. Amongst these remains are portions of a great human figure, which was probably seated cross-legged over the doorway."

To the north of this is Temple 21, which was explored and cleared of debris by Owens and Saville in 1891-92. It rises from the elevated terrace (Plate III. 2) at the north side of the Eastern Court, and, together with the Great Temple (22), explored by Maudslay in 1885, commands the northern side of the Main Structure above the Eastern Court. No. 22, one of the largest buildings that have so far been explored, is thus described by Maudslay (pages 27 to 29):—

"A very well-laid flight of steps, formed of large blocks of stone, leads to a platform in front of the centre doorway. This platform runs along the front of the building, and, at each end of the temple, is carried out at right angles as far as the line of the commencement of the steps. Two large grotesque faces and some handsome carved wing-stones extend across this platform to the head of the steps on either side of the doorway. The doorway itself is 9 feet wide, and was probably covered with a vaulted roof. In front of the doorway leading to an inner chamber is a step, 2 feet high and 15 feet long, carved on its face with hieroglyphs and skulls. At each end of this step is a human figure seated on a huge skull, supporting in its hand the head of a dragon, whose body is turned upwards, and is lost among the scroll-work and figures of a cornice which runs over the doorway. About four feet above the floor in each of the two positions marked X, a stone in the masonry of the wall is pierced by a hole through which a rope could be passed, and holes may also be noticed above the hieroglyphs on the step, which were probably needed for the support of curtains. How the roof of the passage between one chamber and the other was supported is a mystery. It was covered by a number of blocks of stone, and not by a single stone slab; and yet these blocks are square at their edges, and could not have formed part of a true nor of a parallel-laid arch. Possibly wooden jambs and architraves supported these blocks of stone; but if so, all trace of them has disappeared. . . .

"The floor and walls of the outer chamber, as well as the surface of the steps and terrace outside the house, bear traces of a coating of several layers of plaster, each layer differently colored, showing that the plaster had been frequently renewed, and this plaster coating appears also to have extended over the carved surface.

"The inner chamber is without ornament. Two stone incense-burners shaped

into grotesque heads, and some patches of charcoal, were found above the cement floor. The back wall of the house was only just traceable. The outer surface of the front wall facing the Eastern Court had almost disappeared; but that it must once have been elaborately ornamented is proved by the number of headless busts and other fragments of sculptured stone lying near it in all directions.

"On the outside wall of the building at the southwest corner are the remains of a huge grotesque face made up of several stones, much the same in design as the faces which form the principal decoration of some of the buildings in Yucatan. However, the trunk-like nose, which has there so greatly exercised the speculative powers of travellers, if it existed here cannot now be traced. I opened a passage about 4 feet wide between the west end of this house and another much-ruined building, and on this west wall I was able to see some of the ornament, if not exactly in position, at least giving evidence whence it had fallen.

"Three female figures, standing out in full relief from the waist upwards, with the left arm held across the body and the right hand extended in front, palm outwards, as if about to clap hands when in the act of singing, had been ranged along the upper part of this wall; and broken pieces of similar figures, found in other places, lead me to suppose that this decoration was continued all round the temple." (See Plate IX. 1, 2.)

The excavation of Mound 21 brought to light an interesting building occupying the space between Mounds 21 and 22; its walls abutting those of the two mounds. Although neither so large nor so elaborate as Temple 22, and apparently of less importance, it is one of the largest and most prominent of the temples.

From the manner of contact of its walls with those of the mounds, it seems to have been of later construction.

From the floor of the terrace that runs along the northern side of the Eastern Court above the range of seats, four steps (21 *a*) lead up to a terrace in front of the entrance to this temple (Plate IV. 1). A doorway, 7 feet wide, leads to an outer chamber, 25 feet long by 7 feet wide, with floor 12 inches higher than the terrace outside. Across the eastern end is a raised bench or table, 5 feet wide, covered on top with mortar cement, and in front of it is a step 8 inches wide. In the western end there is a square niche in the wall. In the centre of the northern wall is a doorway, 8 feet wide, leading to the second chamber. The floor of this second chamber is about 2 feet above the floor of the outer.

The row of stones composing the threshold projects three inches in front of the wall on the outside, and this projection continues the whole length of the wall. A row of carefully cut hieroglyphs runs along the face of this step, and continues to a distance of twenty inches on either side of the doorway. Under the centre of the doorway, and also at each side, the glyphs are replaced by two circular depressions connected by a loop. In the face of the stones below is a square depression, corresponding in position and width to the mark on the centre of the threshold, and on either side of it a smaller

square with the diagonals running vertically and horizontally; at a short distance on either side of this is a circular depression.

Nothing in the shape of lintels was found about either of the entrances. The inner chamber has the same dimensions as the outer, and like it is floored with a layer of mortar cement six inches thick. The southern wall is three feet thick, the wall dividing the two chambers three feet and a half, and the northern wall four feet and a half.

Outside the eastern wall of these chambers a narrow gallery running from north to south divides the building into two parts; the floor of this gallery is several feet above the level of the floor of the inner chambers, and the remains of the building to the east of this are at a higher elevation.

A stairway leads up from the floor north of Mound 20 to a landing with a small chamber in Temple 21 (Plate III. 2). From the north side of this landing a closed stairway, of which only four steps remain, probably led to a higher chamber or set of chambers. The stairway leading from the floor below is very steep, the steps consisting of two rows of stones, of which the upper projects two inches over the front of the lower. At either side are a number of little platforms at different elevations. The upper part of the stairway, where it passed over a transverse gallery, is gone, and the method is not apparent by which the steps were supported above the gallery.

To the east of this stairway on the level of the pavement is a low chamber or vault, roofed over with stone, covered with several layers of cement. It has two openings in front with lintels of stone, and a small passage leads from it to the face of the river front. On the front part of the roof was a terrace or platform, terminated on the north by two columns built of square blocks of stone, and apparently used to support the roof of another chamber or vault which is gone. Plate IV. Fig. 2, shows the masonry about these vaults, and the openings to the lower vault. A flight of four steps (seen on the right in the illustration), facing the west, leads up from the pavement directly in front of this vault, to a platform in front of a ruined wall, in which a doorway opens upon the remains of a cemented floor overhanging the river. The wall to the right of these steps has a panel formed by a projecting border of stones, and in the bottom of the wall a small opening leads to the face of the cliff. In the excavation of this temple many pieces of sculpture fallen from the ruined façades were removed during the progress of the work. In the interior of the chambers were found two faces in stucco, some obsidian spearpoints, and discs of obsidian, and a beautiful stone chisel.

Immediately north of these ruined temples the northern slope of the Main Structure (Plate II. 2) descends abruptly by large steps or terraces, now much broken and buried beneath quantities of building stone and broken sculptures fallen from the temples above. (Plate IX. 1, 2, 3.) At the foot of the

slope is a low terrace covered with fragments of sculptured stone. From its western end the slope of Pyramid 26 rises to a height of over a hundred feet, strewn with sculptured fragments and building stone. So completely has the ruin been accomplished at this point that not a trace remains of the temple which crowned the summit; but the excellence of the sculptures heaped on every hand bears testimony to the high artistic merit of its architecture.

Attached to the northwest corner of Mound 26 is the low oblong structure, Mound 10. It appears to have the remains of a building on top. A terrace projects from its northern end, and turns at right angles to the west; on the top of its western wing is the square Altar L. Westerly from Mound 10 is Pyramid 9, about forty feet in height, having chambers on the top; at the bottom of its eastern slope is an inclined plane paved with square flat stones, and on the western slope of Mound 10 opposite is a similar inclined plane.

In the space between Mounds 9 and 10 a stone pavement was discovered, covered with a foot of black vegetable mould. The stones of the pavement

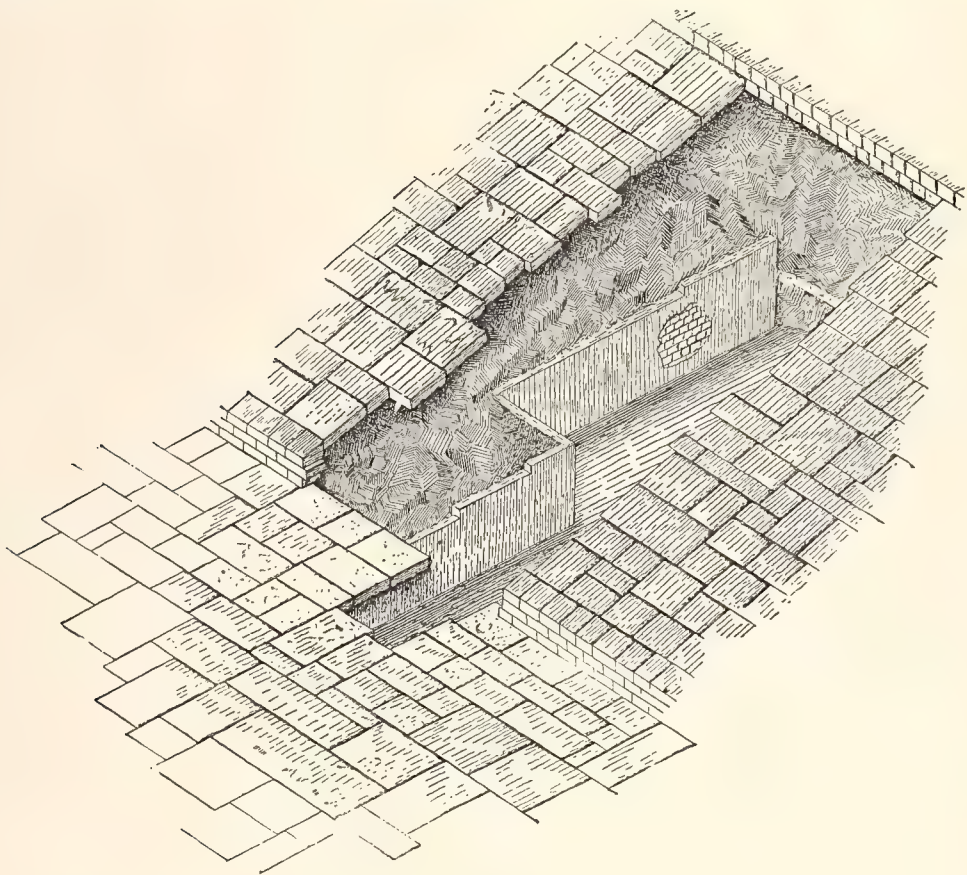


FIG. 1.—EXCAVATION UNDER INCLINED PLANE AT EASTERN SIDE OF MOUND 9.

vary in size and shape. Some are square, and measure from eight inches to three feet on a side; others are oblong, and sometimes as much as four feet in length. All are nicely cut and fitted together, and the upper surface is smooth as if worn by use. In removing some of the stones forming the pavement of the inclined plane on the east side of Mound 9, one was found having two glyphs on its under side. It appeared to have been cut from a larger piece having an inscription. Beneath this pavement an excavation was made (Fig. 1). On a level with the pavement of the court the top of a wall was found running at right angles to the edge of the mound; it is faced toward the north, and was plastered; at a depth of one foot from its top a mortar floor was reached, extending in front of the wall to an unknown distance. Below this the wall continued to a depth of three feet, and at the bottom is another floor. The space between the floors was walled up with red clay and large pebbles. The excavation was continued, following the wall and the lower floor toward the centre of the mound; at a distance of fifteen feet inwards the wall turned at right angles and ran three feet to the south, then turned again at right angles and continued toward the centre of the mound a distance of fifteen feet, and again turned at right angles toward the south. At this point the excavation was discontinued in order to do other work deemed more urgent. No explanation can at present be given of these underground walls and floors. They are entirely below the surface of the surrounding plaza; the upper parts of the walls are broken and irregular, as if part had been torn down, and they are completely buried by the under-filling of the mound; the entire face was plastered, and the plaster at the corners showed traces of paint. There seems to be only one reasonable conclusion,—that they are the remains of older buildings that had been condemned or were in ruins before the later structures were built.

At a distance of eighteen feet inward from the edge of the inclined plane and two feet below the level of the plaza, a shell (*Spondylus calcifer*) was found close to the wall. This shell contained a large bead of polished jadeite; the remainder of the space within the shell was filled with cinnabar.

The north side of this mound (9) was cleared also; it consists of steps like a stairway, and is in a very good state of preservation.

Upon the top of Mound 9 are a series of chambers which have been partly cleared. Here was found a small jar, with a wash resembling a glaze. It stands on three hollow legs, in each of which is a small loose ball of clay.

On the western slope of Pyramid 26 (Plate V. 1), reaching from the floor of the plaza to its summit, a distance of more than a hundred feet, was a grand stairway, the ruins of which impress upon the beholder a deep sense of its vastness and complexity, and force upon him a conviction of what must have been, from the beauty of its situation and the barbaric grandeur of its architecture, the effect of the city in its prime. It is in

complete ruin; and, before excavation was begun, it was so deeply buried beneath the accumulated soil and rubbish that one might easily pass it by without suspecting its character. The discovery of its real character is due to Mr. John G. Owens, who in January, 1893, began an excavation in this place, which, though he did not live to see it completed, resulted in this important discovery. The whole structure is being thoroughly explored, and it is hoped that all the sculpture, or enough of it to indicate its character and design, will be preserved for the ultimate restoration of the stairway. Each step has a row of hieroglyphs running the entire length of its face, for which reason it has been called the Hieroglyphic Stairway; and by this name it will be hereafter designated in our work. Several of the stones which formed a portion of this stairway are shown on Plate V. Fig. 2. A seated human figure (Plate IX. 4) was discovered among the debris. A description of this stairway is deferred until its further exploration leads to a better understanding of its structure.

To the southwest a broad flight of steps, forming the northern termination of the Main Structure at that part, rises from the plaza. Twenty-nine great steps lead to a narrow landing, at the western end of which, at a slightly greater elevation, is a flat platform. From this landing the stairway ascends again, the western end leading to an elevated platform covered with fragments of sculpture fallen from Temple 11. The eastern end of the same stairway leads to the level height at the east of Temple 11, on the same plane as the terraces surrounding the Eastern Court. The central portion of the stairway probably ascends to the entrance of the elevated Temple 11, from which such a quantity of material has fallen as to bury the stairway many feet deep. Temple 11 was one of the largest and most elevated in the group. It was probably a tower, and must have been of considerable height, judging from the quantity of stone lying around its base in every direction. It has never been thoroughly explored, although Maudslay made some excavations into the lowest chambers which were still standing. On pages 21-22 of his volume he gives the result of this investigation as follows:—

“This building presented the appearance of a formless heap of stones, out of which a huge ceiba tree was growing. Some portions of the chambers were excavated. The porches on each side probably extended some distance beyond the line of the walls of the building. The roof and superstructure had entirely disappeared, but the inner wall was in places perfect up to the spring of the vault.

“A step about eighteen inches high and eighteen feet long, formed of two blocks of stone, projected in front of the inner doorway; the face of this step is ornamented with a number of figures seated cross-legged and covered with elaborate breastplates and other ornaments in sharp and well-preserved carving. A carved ornament, made up of several stones let into the wall, rises from this step, on each side of the doorway, and reaches to the top of the wall. This carving is, I believe, meant to represent a

huge serpent's head without a lower jaw ; but the design is executed in a conventional form, and its meaning can only be made out by comparison with many other sculptures of a similar kind.

"The effect of this ornament must have been considerably marred by the continuation of the wall of the passage to the face of the step.

"Above this curious ornament, and extending to a distance of seven feet on each side of the doorway (and probably continued over the doorway itself, although all trace of it has disappeared), ran an elaborate cornice, ornamented with seated human figures and hieroglyphs carved in medium relief. The height of the wall from the floor to the cornice is about nine feet. Ornaments similar to the serpent's head already mentioned occur where a step descends into the southern porch ; but in this case the face of the step is ornamented with a row of teeth, and it forms an under jaw common to the serpent's head on each side. Unfortunately no copy of this design could be made, as the carved stones comprising it were so much broken and displaced by the pressure from above and the growth of the roots of trees that they fell to pieces as the excavation proceeded.

"The interior walls of both the outer porches were ornamented with hieroglyphic and other carvings ; but here also the stones were so much worn and displaced by the roots of trees that nothing could be preserved or copied.

"The walls of the house are built of blocks of stone averaging in measurement 1 foot $\times$ 1 foot $\times$ 6 inches.

"The wall-surfaces retained traces of a coating of plaster which had probably been ornamentally coloured, and the floor was covered with several layers of cement."

To the north of this is the Great Plaza of Copan ; and the whole space from the place where Stela N stands to the north end of the Plaza appears to have been paved with mortar cement, now nearly all broken up by the vegetation, and mingled with the soil. In patches where it is still entire, it is covered with about a foot of black vegetable mould.

In the Plaza are thirteen Stelæ, each having in front of it a sculptured block of stone to which the name of "Altar" has been applied. Excellent drawings of the principal stelæ made by Catherwood in 1839 are given in Stephens' *Incidents of Travel in Central America*, Vol. I.; and in Maudslay's work photographs of the originals and drawings made from plaster casts of nearly all these stelæ are reproduced with admirable fidelity. Of the plaza group of stelæ, six (A, B, D, F, H, N) are standing, the others are fallen and broken (Plate VI. 2).

In the plaza is a Pyramidal Mound (4) with stone casing in the form of steps ; it runs up almost to a point, and had no building on top. Maudslay made an excavation into its southern side, and found the interior to be built of rough stones and hard rammed earth.

"The upper part was composed of rough unworked blocks of stone and mud, with occasional layers of cement and sand ; the lower two thirds of stone and mud only. The excavation was then continued below the level of the plain, through about twelve feet of hard-rammed earth, free from stones, below which the natural soil appeared to

have been undisturbed. In the centre of the mound, about six feet from the top, an earthen pot was found containing a bead-shaped piece of greenstone, pierced, diameter two and three quarters inches, the jade whorl of a spindle, the remains of a necklace of nine jade beads, four pearls, some small rough figures and other ornaments cut out of pearl oyster-shell, and other irregular pieces of roughly carved pearl-shell. At the bottom of the pot was some red powder (which proved to be finely ground cinnabar), and several ounces of quicksilver. Eighteen inches above this pot some traces of bone were found, mixed with sand. At the level of the ground, more traces of bones were found, mixed with red cinnabar powder and sand, and one large pierced bead-shaped stone, diameter three inches. About eight to nine feet below the level of the plain, a skeleton of a jaguar was found lying under a layer of charcoal. I was able to preserve some of the teeth and some part of the jaw, as well as a few small pieces of the other bones, by dropping them into glue. The teeth and part of the skeleton had been painted red. About 100 yards almost directly to the south of this mound, I shortly afterwards opened another very much smaller and much more ruined mound (No. 5),* and, under a thick layer of cement at the level of the ground, found a few small fragments of human bones, two small stone axes, and portions of another jaguar's skeleton, and some dog's teeth, showing that such an interment of animals was not a matter of chance." — MAUDSLAY, page 20.

This plaza has the appearance of an amphitheatre; ranges of seats or steps enclose it on the eastern, northern, and western sides, while the southern side is open. Above the steps on the eastern side a level area extends eastward to Mound 3. On its northern side this area is bounded by a range of steps leading up to a more elevated terrace, on which are what appear to be the remains of stone houses. At a distance of fifteen feet in front of these steps, and 150 feet from the top of the range of seats facing the plaza, two flat stones were discovered in 1895, lying side by side. They had been buried by the soil and rubbish to a depth of several inches, and rested on a layer of broken stone with which the area was paved. Each of these stones measures 2 feet 9 inches by 1 foot 5 inches, and each has a full-length figure carved in high relief on the upper side. (Reproduced from photographs on page 2.)

A fallen Stela E lies on the terrace to the west of the Great Plaza. Stela J stands by itself some distance to the east near Mound 3. To the north, in the centre of the elevated terrace, is a small pyramid (Mound 2) which has a depression in the top, and just west of it is a long, low mound with a similar depression.

Just north of Stela D, two steps lead to a narrow terrace, from which a flight of steps leads up the side of Mound 2. In the centre of the first step in this flight is a stone with eight glyphs in a row on its face. The centre of the next step above is occupied by a block slightly shorter than the first, with twenty-two glyphs carved in two rows on the face. (Plate VI. 1, which also shows Stela D.)

* Mound 5 is not numbered on the plan, Plate I., but is there shown west of Mound 9.

The Square Pyramid (1), rising on the terrace to the west of the plaza, was faced with stone in the form of steps consisting of single rows of stones, and seems to have risen nearly to a point having a square flat space on top. Some visitor has dug into the foundation, but apparently discovered nothing of interest. A stairway in which the steps are elevated slightly above the casing, ran up the centre of the east side. West of this mound is a broad flat terrace, which appears never to have been completed, and is in a very advanced state of ruin. Still farther west, on the plain, the three pyramidal structures, Nos. 54, 55, and 56, also present an unfinished appearance, and are very much destroyed. From the west side of No. 54 the front of a terrace formerly faced with stone runs to the west, and continues three or four hundred yards in a straight line to another group of buildings buried in a thicket. The difference of level is about four feet, and probably corresponds to a natural slope shaped artificially.

A few yards south is the irregular edge of another terrace, also shaped artificially to some extent, but not faced with stone; it extends eastward to Mound 51, which, with Mounds 48, 52, 53, and several smaller mounds, forms an interesting group arranged around the four sides of a court. No. 49 is a detached pyramid badly destroyed. No. 6 seems to be the remains of a long house with a number of chambers. No. 7 has some chambers on top reached from the plaza by a stairway, in front of which is the Sculpture O, an oblong piece, tapering toward the top. This was overlooked by Stephens, but is described, with drawings, by Maudslay. On the west side of this sculpture is the conventional design which Maudslay calls the plumed serpent. On the east side are two similar serpents intertwined; on the north end are a frog and a fish, and on the south end two human figures and a fish.

No. 8 has the appearance of a rough heap of building stone, from the steep sides of which trees are growing. Close by is the group (47) of stone houses, arranged on the four sides of a square court. The most northerly building of the group seems to have been considerably larger than the others. Group 46 presents the appearance of rounded heaps of rough stones.

Immediately south of the Main Structure the ground rises from the river bed in the form of a double terrace, running southward in a straight line. On the first elevation nearest the river there are no buildings. On the second, corresponding to the level of the plain, are many structures of different sizes and shapes, arranged for the most part in groups enclosing a court or square. Of these only a few have been explored.

At the southeast corner of the Main Structure, where the plain terminates in the terrace just described, is a group of buildings which comprises Nos. 30, 31, 32, 33, and 34. Of these only one (32) has been explored; its chambers, of which only the lower parts of the walls remained in position, were cleared

in 1892. A stairway leads from the court on the north side to a narrow landing in front of a thick wall in which a doorway gives access to a gallery which runs around the eastern, northern, and western sides. The southern side of the structure is broken away, and it is uncertain whether or not the gallery continued on that side. It was probably roofed, and it has a thick floor of cement. The inner chamber, separated from the gallery by thick walls, has a cement floor raised a foot above the floor of the gallery. Some of the blocks, forming the steps in the stairway already referred to, had been removed by some former visitor, disclosing a deep vault beneath.

The other members of this group seem to be oblong foundations of the pyramidal type, with casing in the form of steps, and apparently supported buildings of some kind.

Mound 36 was excavated in 1892. The following account is compiled from notes made by Mr. Owens:—

Before excavation the mound presented a very insignificant appearance. It was quite impossible to say exactly where the mound began and the general level of the Plaza ended; but approximately it was 130 feet long by 30 feet wide.

The slope of the mound rose very regularly from the sides and ends to the centre, where it was about $3\frac{1}{2}$ feet high; its surface was covered with large cobble-stones.

The excavations revealed pieces of cemented floors, laid above a foundation of water-worn pebbles. On these, low walls were found, which did not appear ever to have supported roofs. Upon these floors were piled what appeared to be a heap of refuse mingled with cobble-stones and earth; large quantities of potsherds, obsidian knives, some whole pots, arrow-points, and remains of human skeletons were scattered throughout the entire mound. Among the potsherds are specimens of every quality of Copan pottery, from the roughest undecorated ware to that of the finest quality and workmanship. Some of the fragments are beautiful, and show a high degree of artistic merit.

The skeletons were so nearly destroyed that only a few fragments could be preserved. Ash beds were found at different points, and in them many bones of deer and other animals, as well as a number of bone implements.

Some of the bodies seemed to have been thrown indiscriminately among the refuse, while in other cases some attention would seem to have been given to burial rites. Of the first three skeletons only slight traces were found. The following is a list of such as were fairly well preserved, or of especial interest, with a description of each, and the conditions under which it was found.

Skeleton No. 4. Found at a depth of 5 feet; lying on left side, facing east; feet south; knees doubled to chin; hands near head. Some of the teeth were filed, and could be removed only in fragments. Nothing of interest was found with it.

No. 5. Depth, 4.5 feet; on left side, facing south; skull crushed, portions fairly well preserved, and very thick. Two of the teeth were filed. Some fragments of what seemed to be a child's skull were found with it, together with a small painted vase.

No. 8. Badly disintegrated; one tooth has a setting of green jade; two have lost similar settings, and two others are filed.

No. 13. Only a few fragments of the skull and bones were preserved. By the skull was a rude earthenware vase, and between the jaws were found several small disk-like jadeite beads.

No. 16. Apparently placed in a sitting posture; the legs almost upright, and the skull crushed down upon the pelvis. Near by was a small vase of dark brown color.

No. 17. Depth, 4 feet; skull badly decomposed, one of the teeth, which are very large, has a setting of jadeite.

No. 19. Depth, 3.9 feet; head to the west, lying on right side; hands at the head; skeleton almost entirely disintegrated, and few teeth could be found. At the feet were portions of a child's skeleton. With the skeleton were found eight perfect vases and part of another. Beneath the bones were ashes and charcoal, in which were found a jadeite bead, some obsidian knives, and a piece of antler. Above the skull were two flat stones supported by two rude stone walls, running east and west, one at either side of the skeleton.

No. 20. Depth, 4 feet; found associated with a number of bones of deer, and a single earthenware vessel.

No. 21. Depth, 3 feet; head toward the east; lying on the back; arms folded over chest, and knees doubled up above chest. The skeleton lay on a bed of burnt clay, surrounded by a row of large river stones.

No. 24. Almost entirely disintegrated; was surrounded by a row of large stones. It seems to be the skeleton of a child. Close to it was found a single vase.

Nos. 25 and 26. Below the walls of the structure. The bones of these two skeletons were intermixed. Two of the teeth of No. 25 had settings of green jade, and the bones are very large; a single bowl was found associated with the bones, and a piece of silicified charcoal about 9 inches long, which before being broken was nearly cylindrical, and 7 or 8 inches in diameter.

No. 27. Depth, 3.7 feet; appears to be the skeleton of a child, much destroyed; with it was found an obsidian knife and a shell.

No. 28. Depth, 3.5 feet; lying on right side, and doubled up. A few teeth were saved, which were covered with tartar. Under the head was found a jadeite bead, and beside the skeleton were five earthenware vessels of different shapes; two of these were decorated.

No. 29. Depth, 5.5 feet beneath floor of structure; only portions of the larger bones and three molars remained. There was no apparent form of grave, and no objects of any kind were found associated.

No. 30. Depth, 4 feet. Child's skeleton, of which very little remained; no form of grave, and no associated objects.

No. 31. Depth, 4.9 feet; head toward the north and turned on right side; rest of skeleton on back; cranium almost entirely destroyed, but jaws in fairly good condition. Just below the lower jaw in front, where the neck would be, was found a large jadeite ornament, 4 inches long. It was pierced longitudinally, and lay as it would if suspended from the neck. Near the head was an earthenware bowl.

No. 32. Depth, 3 feet; fragmentary remains of a child's skeleton; two jadeite beads, a shell disk, and a number of small shell beads were found with it; no form of tomb.

No. 33. Depth, 4.2 feet; head toward the southeast; lay on left side with left hand under head; bones in a fair condition; no form of tomb.

No. 36. Depth, 5 feet; head toward the east; very little of the bones remained, but the teeth were in a fair condition; the two inner incisors (upper) filed and ornamented with little disks of jadeite set into cavities made in front, as in the case of others mentioned.

The group of unexplored mounds, comprising Nos. 37 to 40 inclusive, presents the appearance of large rough heaps of stones and debris. They probably represent buildings of the usual type with pyramidal foundation.

Immediately to the southeast of this last group is another group, consisting of Nos. 41, 43, 44, 45, and a few small mounds, which look like rounded heaps of water-worn pebbles. Of this group, No. 41 has been partly explored. When the outer walls had been cleared, the structure turned out to be a long, low building, with a number of small chambers, each having a separate entrance from a narrow platform, reached by a flight of three steps in the centre, running along the west side which faces the court. The northern chamber is divided from the rest of the house by a gallery which connects the platform in front with the smaller one at the back. None of the chambers have ever been cleared out. On the eastern side, which may be called the back, a platform occupies a little more than half the length at the southern end. It is terminated at the north by a wall, which abuts the building at right angles and runs to the east. To the south of the wall are two pits, about five feet deep, sunk beneath the level of the pavement and walled with stone. In these pits were found what appears to be the remains of fireplaces, and a large quantity of broken pottery. The largest of these pits was 32 by 40 feet. If they ever had walls above them, these must have been of some other material than stone.

Mound No. 43 shows distinctly the remains of a stone house above its pyramidal foundation, with slopes in the form of steps. A stairway leads from the court on the southern side. The character of the other mounds in the group is not so apparent.

Somewhat less than a mile from here, in a southerly direction, the river turns rather abruptly and flows to the west. The intervening plain, to within five hundred yards (approximately) of the river, is covered with the remains of stone houses, arranged for the most part in groups in a manner similar to those just described. Among these are found a number of sculptures, including portrait-like heads and grotesques. None of these mounds have been explored, and very little can be said about them. They continue in a westerly direction for more than a mile to the edge of the plain, but never approach any nearer the river.

To the northeast of the Main Structure the ground rises about two hundred yards from the river bank in the form of a terrace which, approximating the direction of the course of the river, continues some distance up the stream. The ground between this line and the river has no remains, but the higher ground is covered with ruins which have not been explored. To the northwest of the Plaza, extending as far as the foot-hills of the mountains, is a larger group of mounds buried in a dense thicket. To the west of the Main Structure is another large group, or number of groups, occupying almost all the plain between the Main Structure and the modern village of Copan, — a distance of about a mile and a half. Among these are to be seen many scattered fragments of sculpture, particularly in the vicinity of two mounds occupying central positions in their respective groups, and conspicuous for their great size.

At a distance of more than half a mile to the north, near the river, is another prominent group hidden in the thicket. One mound, standing at the southern end of a courtyard in which are several pieces of sculpture, is particularly noticeable.

Scattered remains are to be seen along the course of the river as far up as the modern village of Sante Rita, a distance of eight or nine miles. Among these different groups, and particularly numerous toward the extremities of the plain, are the remains of stone foundations, without any trace of superstructure. It seems probable that upon these stood wooden houses of which every trace has disappeared.

On the slopes of the foot-hills on the eastern side of the river are a number of ruined stone houses, and on the top of a table mountain, called Albonete, to the northeast, whence a fine view of the ruins is obtained, there are some scattered remains of stonework. On the slope of a mountain to the east, at a distance of 1.50 miles from the river, are the remains of a stone structure of some kind, and the fallen and broken Stela 12, with an inscription on each of its four sides. 2.75 miles to the west is a mountain peak commanding a splendid view of the whole valley; on its summit is Stela 10, fallen and broken; this is similar to the one on the east. A line joining these two stelæ passes very close to the southern slope of the Main Structure (see line indicated by arrows *a b* on plan), and bears N. $86^{\circ} 46'$ west (magnetic).*

The quarries from which the stone was taken for the monuments and buildings are in a ridge to the northwest. The rock is a trachyte, and outcrops along the ridge in abrupt ledges. Deep excavations are to be seen, and large quantities of chips and flakes are found, together with some quarried blocks. Several detached stelæ are found at different points of the valley. They are all fallen and broken, and much less elaborate and striking in appearance than those in the great Plaza.

So far no regular burying-place has been found at Copan, but a number of isolated tombs have been explored. Two were found just south of the Main Structure, under the surface of a level court (see plan), one under the steps of Mound 32, some in the level valley farther south, and others to the northeast and to the northwest. At different parts of the ruins, tombs were found under the steps of what would seem to be ruined houses.

Those found in the open plain were marked by scarcely perceptible elevations in the general level of the ground. In each case loose building stones were strewn around, but they had more the appearance of having been left there by the masons after the work was finished than of having formed any structure above the surface. The tombs are small chambers or vaults built of cut stone beneath the surface of the ground, and covered with slabs of stone laid across them. These latter are sometimes on a level with the ground, or at a slight elevation above it, and sometimes several feet below. There are usually several niches in the interior of the walls. The following account of these tombs, explored in 1892, is taken from reports of M. H. Saville and J. G. Owens:—

“Tomb 1, situated 90 feet south of the Main Structure, and about the same distance east from Mound 36, in an open court, consists of a large chamber, lying

* The magnetic declination at Copan was found to be 6° east.

approximately east and west, and measuring 5 feet in depth, $5\frac{1}{2}$ feet in length, and 2 feet in width, with a smaller chamber running northward from its eastern end, measuring $3\frac{1}{2}$ feet in length, 3 feet in width, and $3\frac{1}{2}$ feet in height. The walls of both chambers were of cut stone, regularly laid. The slabs of stone forming the roof were about 1 foot below the surface of the pavement, which was broken, and one of the roof stones thus exposed had been removed at some previous time. The roof of Chamber 2 was 2 feet lower than the roof of Chamber 1, and the floor of Chamber 2 was 11 inches lower than the floor of Chamber 1. The whole vault was filled to within a few inches of the top with brown earth mixed with wood ashes and charcoal. In removing the earth the following objects were discovered:—

“The remains of two skeletons, of which only some of the teeth and a few fragments of the bones could be preserved. In one instance the four upper incisors were inlaid with little circular bits of jadeite, each fitted into a hole drilled in the front of the tooth. These jadeite ornaments are slightly rounded outward and highly polished. The two upper middle incisors were further modified by being filed on the inner corners. The left canine had a circular cavity drilled in the enamel in front, showing where it also had been ornamented like the incisors. An upper left lateral incisor found with the other skeleton had a similar decoration. (See page 32.)

“In different parts of the chambers, twelve earthen vessels of different shapes and sizes were encountered, most of them decorated with figures in different colors.

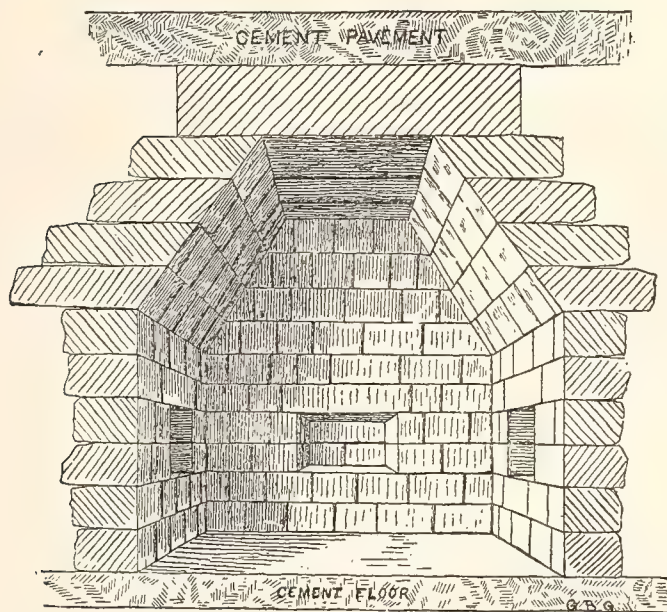


FIG. 2.—CROSS-SECTION OF TOMB 2. WIDTH INSIDE, 5 FEET.*

One vase represents the head of a wolf, modelled with great accuracy, and exhibiting an extraordinary degree of artistic merit. (See page 48.) With these were found a number of shell ornaments and jadeite beads, a pottery whistle, bone needles, the upper jaw-bone of a peccary, the radius of a deer, and, most interesting of all, the upper portions of two skulls of the peccary, one of which, very well preserved, is beautifully carved on the outside with figures of men and animals and symbolical characters.

“Tomb 2 was found 27 feet west of Tomb 1. It was

marked by a pile of loose building stones, probably the ruins of some structure built over it. The chamber lying east and west was $5\frac{1}{2}$ feet in length and 2 feet in width at

* This is a good illustration of the characteristic arch of the ancient buildings in Central America and Yucatan. The drawing also illustrates in a general way the construction of the rooms in the buildings of Copan, and the form of the arch which supported the roof. In a few instances tiers of the bevel-faced blocks of stone, forming a portion of the arch, have been found in place above the side walls of a building.

the top, and 5 feet between the vertical walls below; the height is 5.2 feet (Fig. 2 cross section). It was filled to within a few inches of the ceiling with dry hard packed earth, very hard to remove. Ashes and some bits of charcoal were found near the top. On the floor were the crumbling remains of a skeleton. Four earthenware vessels, each painted with figures, some jadeite and shell ornaments and animal bones were found.

"Tomb 3 is under the steps of a ruined house, at a short distance to the north of the great Plaza. An old excavation had brought to light a chamber running east and west. A roof-stone, 4 feet 9 inches long and 1 foot 4 inches wide, had been removed, but no attempt had been made to clear the chamber of the clay that nearly filled it. The top of the vault was $1\frac{1}{2}$ feet above the level of the ground in front of the steps. Portions of the earth had been greatly disturbed by ants. The floor of the vault is at three different levels; at the eastern end was a section $4\frac{1}{4}$ feet long, the cemented floor of which was $3\frac{1}{2}$ feet from the roof. The middle section, 4 feet in length, width $3\frac{1}{2}$ feet, was 11 inches lower; like the first it was covered with mortar cement. The western section was $3\frac{1}{2}$ feet long, and was 7 inches narrower than the other two, the wall on the southern side being built further in. This section was $1\frac{1}{2}$ feet above the middle section, and was not cemented. The walls at this part were rougher and not so regularly constructed. The side walls of the vault converged somewhat toward the top, and the roof consisted of seven slabs, averaging $1\frac{1}{2}$ feet wide, 1 foot 2 inches in height, and 3 feet in length. In the northern side of the vault, about 5 inches above the floor, and near the eastern end, was a niche 1 foot in length, 10 inches in height, and 18 inches deep. Another niche in the centre of the southern wall, 1 foot 9 inches above the floor, was 10 inches high, 15 inches deep, and 1 foot in breadth. Nothing of interest was found in either. In this vault were found the usual objects of pottery, obsidian, shell and jade, a few fragments of animal bones, a piece of gnawed antler, a horse's tooth,* and fragments of another. A human skeleton, which lay on the floor in the eastern end, was in an advanced state of decay. The left femur had been gnawed by some animal. The depression in the middle of the floor of the vault had been filled up with clay to a level with the eastern section.

"Tomb 4 was found about midway between the Main Structure and the modern village of Copan, about 100 yards north of the road. There is a mound, 37 by 32 feet, built on the slope of one of the foot-hills. On the eastern side had once been a flight of steps, 15 feet wide, ornamented with several stones carved in a conventional pattern. The land where this mound is situated has been used for planting, and an excavation, made by some native in the top of the mound, revealed a large flat stone, which proved to be one of the roof stones of a vault, 2 feet 3 inches in width, 3 feet 5 inches in length, and 2 feet in height. Nothing was found in this chamber, but the northern wall was open and gave access to a larger chamber, the floor of which was 1 foot 4 inches below the floor of the first. This chamber was 4 feet in length from east to west, and

* These teeth of a horse had been broken from the jaw, and they may have fallen into the tomb or have been carried there by rodents during the interval since it was first opened and its exploration by Mr. Saville. The gnawing of bones in the tomb and the ants' nest show that there has been considerable disturbance of materials. We must, however, remember that these teeth may possibly have a bearing upon the existence of an American horse in prehistoric time. In this connection, see Cope, note on *Equus fraternus*, Amer. Phil. Soc., vol. xxxiv. p. 466, 1895.

2 feet 9 inches in width. The roof was built in the form of the horizontal arch, the capstone being 4 feet 9 inches above the floor, which was made of rough stones.

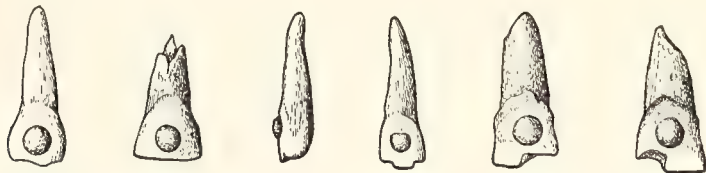
"In this chamber were found four decorated earthenware vases. In the northern end were the remains of a skeleton badly decayed; of the teeth, only the crowns remained. At either side of the head was found a circular ear ornament of green jadeite, about one inch in diameter, with red pigment adhering to the inner surface. Four jadeite beads were found near the head, and a piece of jadeite, about an inch in length, on which was carved a human face. Some charcoal and burnt earth were mixed with the clay which filled the vault.

"At a few paces to the southeast of the mound in which this tomb was found, is another mound of the same dimensions. An excavation made into the centre, at some former time, showed a ruined chamber about 22 feet in length; the roof and most of the walls had fallen in. Over the fallen roof-stones was found the skeleton of a young person, above which some rough stones had been placed. The skeleton lay on the right side, with the knees doubled up to the chin. Nothing was found with the skeleton. On clearing out the chamber nothing was found on the stone floor over which the roof had fallen.

"Tomb 6 is about half a mile from the main structure, in a northeasterly direction, on the lower foot-hills, in an old tobacco field. It was indicated by three large flat stones lying side by side, their upper surfaces about 9 inches above the general level of the ground; they measured 5 feet in length by $2\frac{1}{2}$ feet by 1 foot, and formed the roof of a chamber 6.2 feet in length, 2.5 feet in width, and 3 feet in depth. It lay almost due north and south, was filled with clay, and was divided by a row of stones across the middle of the floor into two sections. In the southern part were found the crumbling remains of a skeleton with a few rude pieces of pottery. In the northern section a portion of another skeleton was discovered lying on the stone floor. Near by were fragments of the skull of a third skeleton. A piece of pottery, $13\frac{1}{2}$ inches long, in the form of a perforated ladle, the end of the handle representing the head of a serpent, was found near the skeleton. This, in all probability, is an incense burner.

"Tomb 7 was discovered at a distance of about 20 rods west of Tomb 6. The chamber lay nearly east and west, and was filled with clay, in which only a few fragments of human and other bones were found, together with a small metate, or rubbing stone, and a plain stone object 3 inches thick by $1\frac{1}{2}$ by 8 inches, with three projections like legs.

"Tomb 10 lies 40 rods south of the main structure and 8 rods from the river, in a level area. The usual roof stones projecting above the surface showed its presence. In removing the clay with which it was filled, four beautiful jars or vases of exquisite workmanship were encountered at a depth of $2\frac{1}{2}$ feet below the surface, and 2 feet from the floor of the vault, together with a small stone celt, an obsidian flake knife, a ladle-shaped piece of pottery similar to that found in Tomb 6. With these were removed a few crumbling fragments of the skeleton of a child."



HUMAN TEETH FILED AND ORNAMENTED WITH JADEITE. (See page 30.)

THE MONOLITHIC MONUMENTS.

THE sculptured columns or tall monolithic monuments of Copan, to which the name of Stelæ has been applied by Maudslay and others, and is adopted here for the sake of uniformity, have not only furnished the chief attraction to travellers, but have given the ruins their principal fame and their distinctive character. Of the twenty-three of these monuments now known, fifteen are situated in or about the great Plaza, and in this group are included the largest and most elaborate; six of their number are standing, the rest are overthrown and broken. The average height from the ground does not exceed twelve feet; the average breadth is about three feet, with a thickness slightly less than the width.

All of this Plaza group of stelæ are indicated by Maudslay on his plan; but some were half buried beneath debris and rubbish, and were cleared for the first time by the Peabody Museum Expedition. A complete set of photographs and moulds were made of these as well as of the better-known stelæ. Associated with each stela, and usually from ten to fifteen feet from its base, is a smaller sculpture, called for convenience of description an altar. These may be said in general to be monolithic, although in some cases associated smaller parts, such as the head and legs of an animal, are carved on separate pieces.

The following is Palacio's description of what he saw of these monuments:—

"In this square are six great statues, three representing men covered with mosaic work and with garters round their legs, their weapons covered with ornaments; two of the others are of women with long robes and head-dress in the Roman style. The remaining statue is of a bishop, who appears to hold in his hand a box or small coffer. They seem to have been idols, for in front of each of them is a large stone with a small basin and a channel cut in it where they executed the victim and the blood flowed off." *

The name "idols" is used to-day by the natives living in the vicinity of the ruins when speaking of these monuments of their predecessors, concerning which they appear to have lost all tradition. So little has been accomplished since Palacio wrote, in the way of interpreting the monuments, that the

* A letter from Diego Garcia de Palacio to King Philip II. of Spain, dated Guatemala, 8th March, 1576. Maudslay's translation. See Appendix for this letter in full.

description which can be given to-day is scarcely more satisfactory than his, written more than three centuries ago, and must be at best but an enumeration of details in the design.

The following is Maudslay's description:—

"The monolithic monuments at Copan are cut from a somewhat decomposed trachyte rock; for convenience of description, they may be divided into Stelæ and Altars.

"On the front of each Stela,* and in some cases on both front and back, is a representation of an elaborately decorated human figure. On the back (when it is not occupied by a figure), and in some instances on both back and sides, is a hieroglyphic inscription. The design is sometimes completed by the addition of scroll-work derived from the form of the feathered serpent, to which is added a number of small human and grotesque figures.

"The ornamentation throughout the sculptures is no doubt to a great extent symbolical, and in the decoration of the Stelæ more attention appears to have been given to the display of such ornamentation than to securing correct proportion in the representation of the principal figure; but that the errors in proportion did not arise from the want of knowledge is clearly shown by the far superior treatment of some of the smaller figures on the same monuments.

"Almost the whole of the ornamental carving decorating the Stelæ at Copan is derived from the following subjects: The feathered serpent, grotesque human and animal figures and masks, feathers and feather-work, fish, bands and plaits made of some pliable material such as leather or bark-cloth, and loops and ties made from a softer material. Geometrical patterns, except such as are formed by the folds and plaits of a material with straight parallel edges, are not to be found (unless circles and dots can be so considered). Foliations and other vegetable forms are (with possibly one exception) entirely absent from the designs.

"The dress and ornaments of the human figures represented on the Stelæ, although affording infinite variety in detail, are not only similar in general design on all the monuments at Copan, but on all monuments of the same class throughout Central America.

"Until the inscriptions are deciphered, there is little to help us in determining whether the figures on the Stelæ are intended to be portraits of chieftains or priests in ceremonial costume, or whether they are fanciful representations of heroes or deities. The strong individuality of many of the figures gives force to the former view; but, on the other hand, there are two of the figures which cannot be included in the category of monumental portraits, as their faces are covered by grotesque masks. The great exaggeration of the personal adornments would be more likely to occur in imaginative figures than in portraits; but a possible explanation of these exaggerations may be learned from some of the sculptures themselves. The carving on a wooden lintel taken from a temple at Tikal (part of which is figured on Plate XXIII.) represents a central human figure standing under the arched body of a great feathered serpent, on a sort of stepped platform which rests on a framework of poles. This

* This cannot be said to apply to Stela J, which has a highly conventional face on its western side but no representation of a figure.

suggests the probability that images made from some lighter material than stone may have been kept in the temples, and used on the occasion of religious processions. And it may be that the exaggerated adornments of the figures on the Stelæ were copied from the elaborate ornaments with which in all countries and in all ages it has been customary to adorn such processional figures.

"There is not at Copan any certain evidence of the use of textile fabrics, but it is probable that the waist-cloths and turban-like head-dresses of some of the figures were made from woven material.

"Considerable difficulty is met with in attempting to trace the development of the designs used in the ornamentation: firstly, because, with the exception of feathers and the skins of jaguars, we are not certain of the kind of material from which the ornaments and dress were originally made, and can form no idea of how far the design may have been influenced by the nature of the material worked in; and secondly, because the original designs may have been considerably modified when transferred to stone by workmen who had probably no better tools than chips and flakes of obsidian." — MAUDSLAY, pages 33-34.

The stelæ were oriented as follows: A, B, E, 4, face east; F, H, I, J, M, P, 6, face west; C and 5 face east and west, being double-faced; D faces south; N and 3 face north and south.

Each stela is supported upon a base or pedestal, sometimes on a level with the surrounding pavement, and sometimes several feet below. This base consists of a flat slab of stone from 4 to 6 feet square, and about 1 foot thick. In four instances of fallen stelæ, vaults have been found underneath the support of the monument. These vaults consist of two shafts crossing at right angles under the centre, their ends lying in the directions of the four cardinal points. They are built on several large slabs, which serve as a floor and as a foundation. They are constructed of squared stone, laid without mortar, and are very strong and well made. Above the pedestal the monument is usually supported by stonework, laid against its sides.

The vault under Stela M (Fig. 3) was opened in January, 1895. The ends had not been closed, and the clay thrown against it had made its way in, filling it up to within a few inches of the top. The base of the monument (which had fallen) was on a level with the surrounding pavement, which came up against it on all sides, sealing completely the entrances to the vault below. The monument was supported on its base by an oblong block of stone, placed against it on each side. The dimensions of the vault are: length of east and west shaft, 9 feet 8 inches; width, 1 foot; depth, 2 feet. The other shaft has very nearly the same dimensions as this. Considerable care was taken to determine as exactly as possible the direction of the shafts; one was found to bear twenty minutes west of the true north, and the other is at right angles to it. In this vault were found thirty earthenware vessels, of various grades and styles of workmanship. Some of the coarser kind were to a great extent disintegrated; others of a finer

quality were perfect, and several of these were decorated with figures painted in different colors. A small jar was filled with black sulphide of mercury, and covered with a shell (*Spondylus calcifer*). A few rough bits of jadeite and some fragments of stalactites were also found.

The pedestal of Stela C (Fig. 4) is three feet below the pavement; the vault underneath it (Fig. 5) is much the same as the one just described, but is closed at each end by a block of stone; the north, south, and west arms widen towards the outer end; the east arm is shorter, is the same width throughout, and is closed differently. In this vault were found only a few pieces of rough pottery.

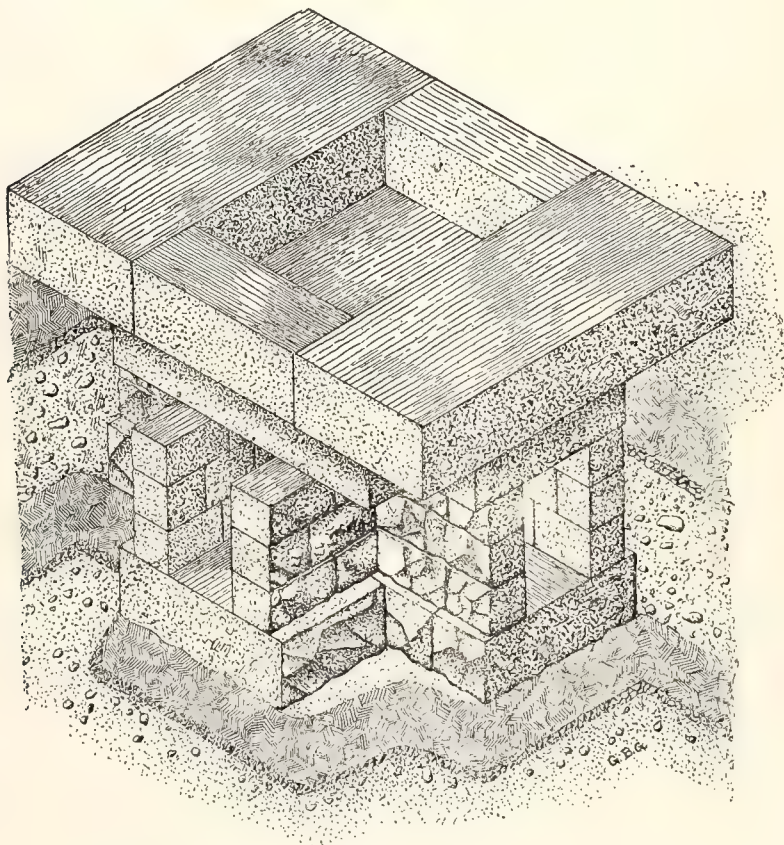


FIG. 3. — VAULT UNDER STELA M. Isometric Projection.

In front of Stela I a similar vault was found, containing several vases and jars of a very fine quality, painted with figures.

No vault was found associated with Stela 3; the pedestal rested on three layers of narrow oblong stones, under which was a pocket of pigments of different colors; in this were found four jadeite ornaments, very nicely cut and polished; each is pierced longitudinally by a round hole through which a string could be passed for suspending the object.

Excavations revealed the base of fallen Stela 1 in place on line of second step of stairway forming the western slope of Mound 9. From the vault

beneath were removed five rude earthenware vessels, fragments of stalactites, shells of the *Spondylus calcifer*, a large jadeite bead, and a quantity of cinnabar. At the foot of the stairway stands a circular altar broken nearly in halves and resting upon blocks of stone. A drawing by Mr. Gordon showing this altar and the fallen stela restored in place is given in Fig. 6.

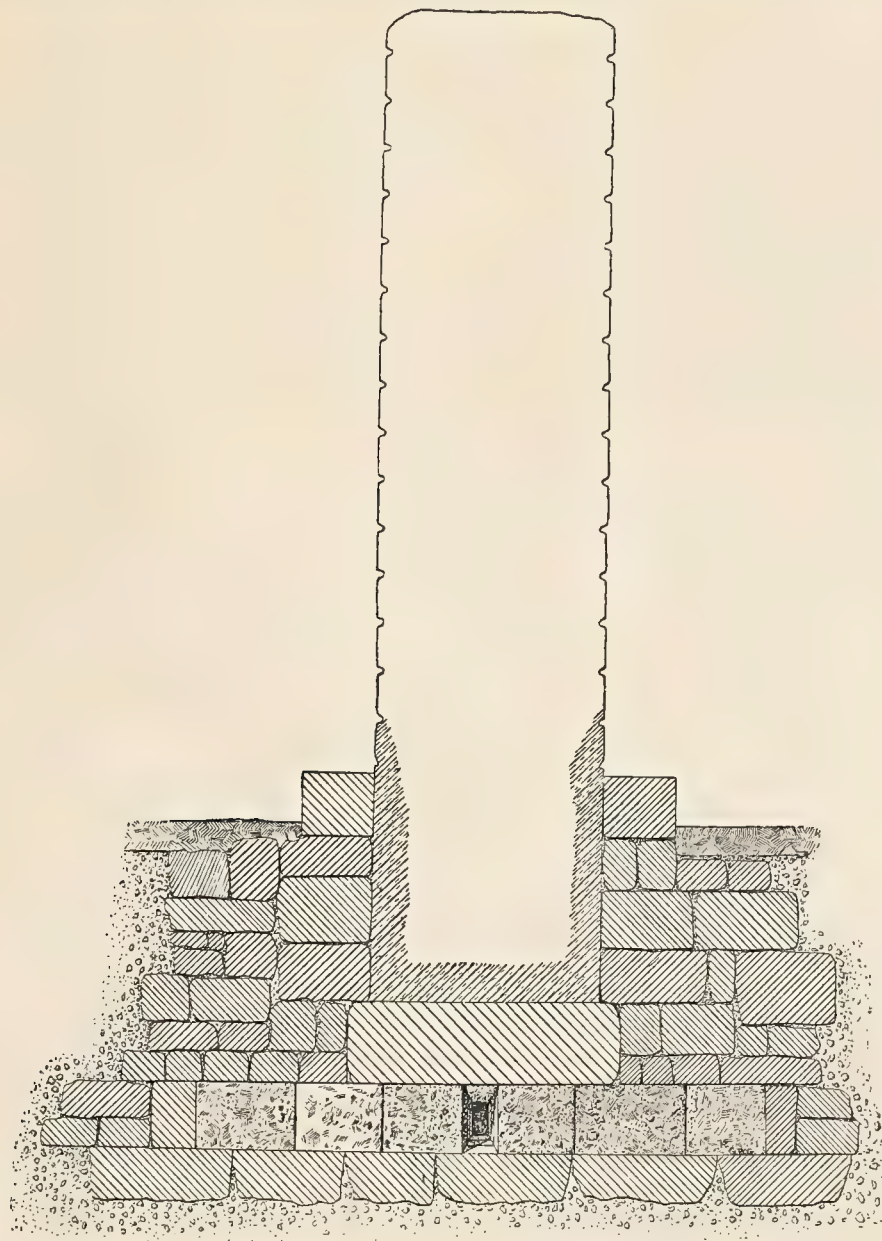


FIG. 4. — CROSS-SECTION OF STELA C, SHOWING VAULT AND STONWORK AT BASE.
Scale 1 inch = 3 feet.

Outside the principal ruin shown on the plan (Plate I.) seven stelæ are known, including the two on the mountains to the east and west.

Stela 6 is in the bush, several rods to the north of the path leading from the ruins to the modern village. It had fallen, but was in a fairly

good state of preservation; it was raised to its former position by Owens and Saville in 1891, when it was moulded and photographed for the first time. The four sides of this stela are shown on Plate VII.

Stela 7, which lies in the bush to the west of the modern village, is fallen and broken. It was moulded and photographed in 1893. The face, which consists of a full-length figure, is very much broken, and no mould was made of it. The other three sides are covered with hieroglyphs.

Stela 8 was found by Mr. Owens in 1893, lying in the bush to the northwest of the modern village. It seems to have stood upright, supported on either side by two other stones of an equal size with it, but lying flat.

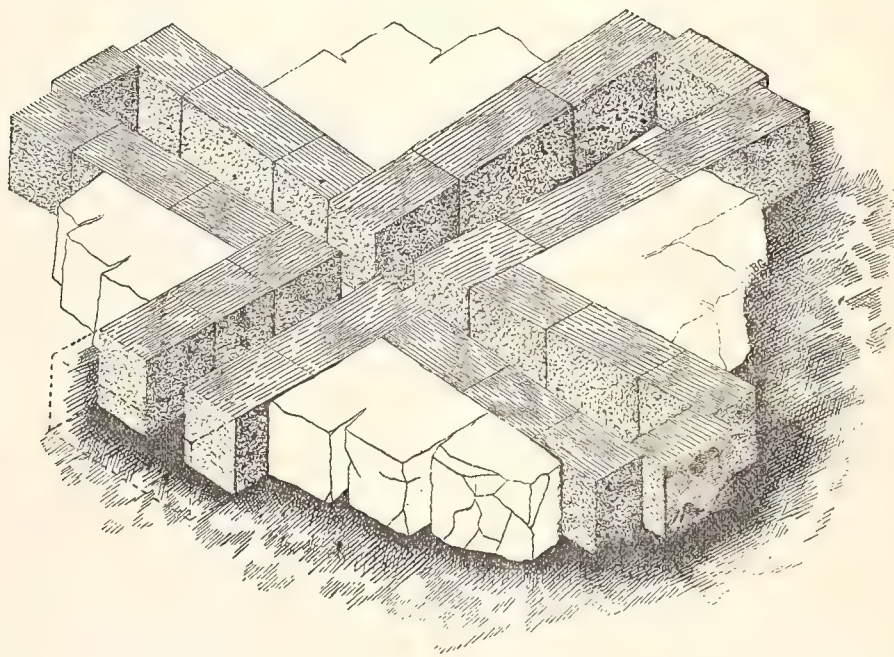


FIG. 5. — VAULT UNDER STELA C. Isometric projection. Scale 1 inch = 3 feet.

One of these (9) had originally hieroglyphs on all four sides, — two of these sides being well preserved, while the others are almost totally destroyed. The same is true of 8.

An excavation was made by Owens beneath the place where these were found, but it revealed nothing except a few rough stone beads. Moulds were made of both stones.

Stela 5 stood near Stela 6, but is fallen and broken in many pieces; it had a full-length figure on either side, and in front of each was an altar with an inscription, now almost totally destroyed.

A small cylindrical column, dug up in 1892 in the passage to the east side of Pyramid 16, and called Stela 11, has on one side a full-length figure, with the face turned in profile. The marked manner in which the forehead recedes amounts to deformity; the nose is large and aquiline; the

teeth and lips projecting, and the chin bearded. A large double plume attached to the headdress extends behind the figure, and a winged scroll derived from the head of the "plumed serpent" extends in front, another above, and a third at the side of the head. This figure and the associated symbolism occupy three-fourths of the surface of the stone; the other fourth is covered with a hieroglyphic inscription (Plate VIII.).

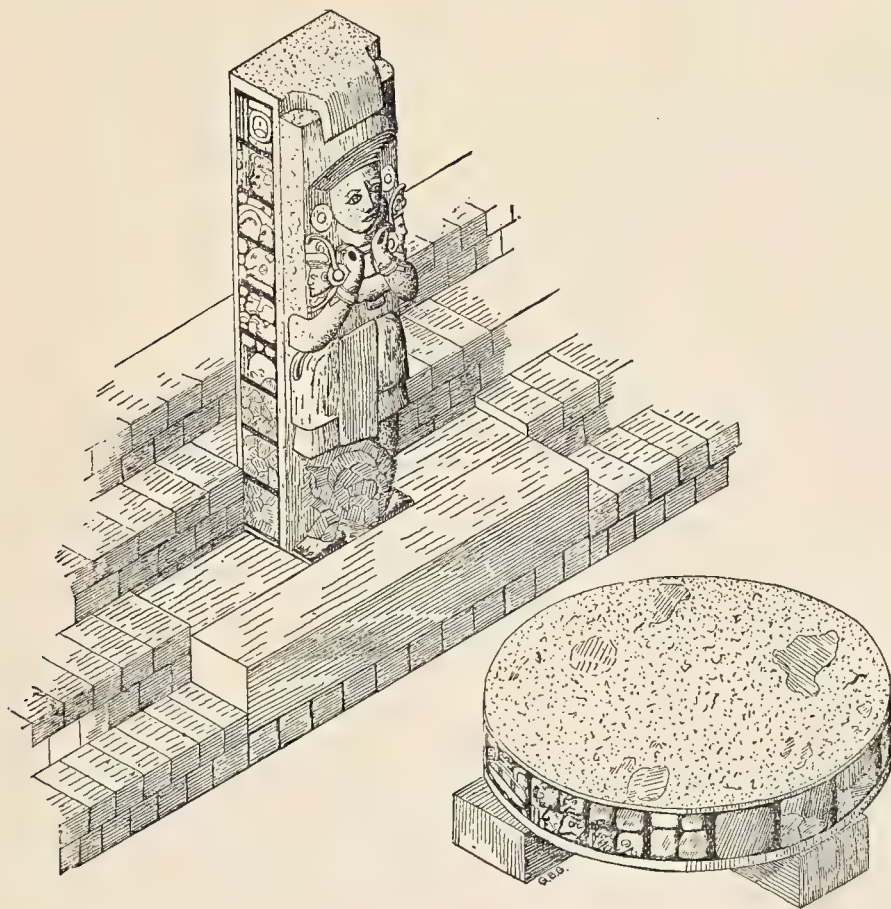


FIG. 6. — STELA 1, AND ALTAR (restored), showing position of Stela in Stairway of Mound 9.

The second class of monoliths, called altars, take two characteristic forms. The most conspicuous form represents in each case some fanciful and grotesque animal, or else each side of the altar presents a grotesque face after some conventional type. The decoration is usually very elaborate; but in some cases the design is quite simple, as in Fig. 7, an altar lying to the west of Stela C. The body resembles a turtle, although the lines do not correspond in direction to those on a turtle's back, but run diagonally. The edge is almost a perfect circle, 7 feet in diameter; the under side is flat, the top

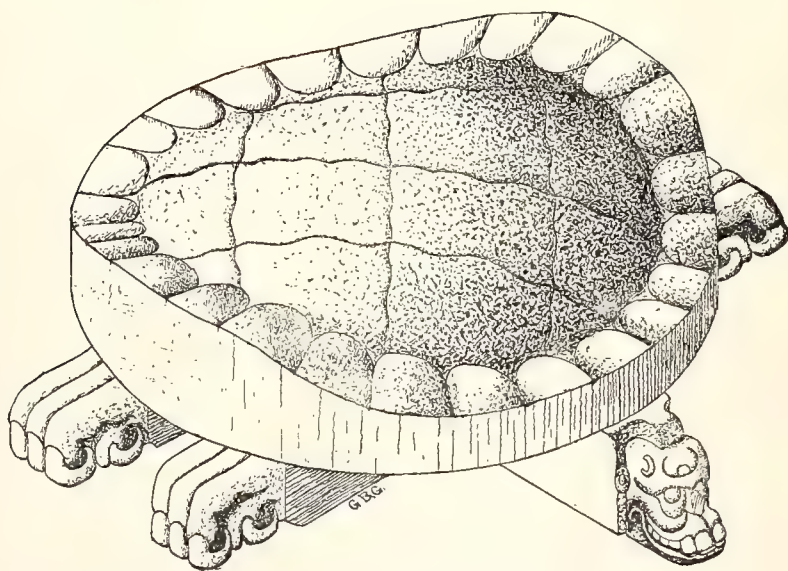


FIG. 7. — ALTAR OF STELA C (restored).



FIG. 8. — ALTAR OF STELA C, WITH FALLEN STELA BEHIND IT.

rounded towards the centre, and raised at both sides over the legs. The head and claws are cut from separate pieces of stone, the former being the usual conventional Death's head, while the claws are unfamiliar. It faces the west, but near the eastern side some fragments of a grotesque head were noticed, which in all probability formed a second head on the animal, facing towards the stela. Fig. 7 is from a drawing by Mr. Gordon showing the altar in detail with the parts restored. Fig. 8 is a reproduction of a photograph showing the altar with the fallen and broken stela east of it.



FIG. 9. — FRONT OF SCULPTURE Z.

The other form of altar is a flat circular stone, sometimes as much as 7 feet in diameter; the top is plain, but the cylindrical edge has one or more rows of glyphs running around it (Fig. 6).

There is still another class of monoliths which have also been designated



FIG. 10 — BACK OF SCULPTURE Z.

as altars, and sometimes as tables. They are square or oblong blocks of stone with flat tops, and seldom exceed two feet in height; they are usually carved on the four sides, and sometimes on top, either with an inscription or some other design. Most of these have been described by Maudslay.

Altar L, mentioned on page 20, is 3.7 feet square and 2.6 feet high; on one side is a design in medium relief representing two seated human figures with a vertical row of glyphs between them. A drawing of this side is given by Maudslay on Plate 73; but he makes no mention of the opposite side, which is more

weather-worn, but retains the outlines of a similar design only partially executed. The other two sides and the top are plain, which is unusual; and it is probable that the sides at least were to be carved.



FIG. 11. — SIDE OF SCULPTURE Z.

represent a square bundle tied with flat bands. One band, passing across the top and down the ends, divides the stone lengthwise; another similar band divides it crosswise, and two others parallel to this encircle it near either end. Each of the latter, at the point where it crosses the longitudinal band on top, is tied in a knot. On either of the longer edges of the stone a band, running lengthwise, is tied in a knot at the centre; behind this band appear two figures wearing masks and facing each other; the right hand of each figure is raised and extended toward the other; on one of these sides a dragon's head appears in the design. On either of the shorter edges is an inscription divided into groups of four glyphs by the band that passes down the centre.

Sculpture X was discovered in 1895 near the fallen Stela 5, of which it had formed the pedestal. The design is precisely the same as that of Y. This sculpture was also found beneath the pavement.

Somewhat resembling these altars, are several sculptures, of which Z, discovered in April, 1893, upon elevation between the Eastern and Western courts, is $2\frac{1}{2}$ feet high; the top, which is plain, measures 18×22 inches. The front (Fig. 9) is a grotesque face; the back (Fig. 10) and sides (Figs. 11, 12) are covered with glyphs.

Sculpture Y was dug up in the Plaza, near Stela 4, in 1894. It was entirely buried, and seems to have been placed in its underground position to support the stela. The design of this sculpture seems to



FIG. 12. — SIDE OF SCULPTURE Z.

These two sculptures differ from those previously known at Copan; the relief is very low, the character of the sculpture is peculiar, and the design new. The stone itself seems older than that of any of the sculptures already known; it is more decomposed and readier to crumble. Both were buried not by accident, but by the people who set up the monuments with which they were found associated, and it would seem that they were consigned to these comparatively insignificant uses, when the use for which they were originally designed was no longer understood or appreciated.

Either they were obsolete relics of a former people or period, when these later monuments were being set up, or they were condemned as imperfect or undesirable sculptures.

The first theory seems the more plausible from the fact that nothing like them is found where it could possibly have been an object of use or ornament in the later days of the city's history.



ALTAR IN FRONT OF STELA D.

APPENDIX.

COLLECTION OF RARE AND ORIGINAL DOCUMENTS AND RELATIONS
CONCERNING THE DISCOVERY AND CONQUEST OF AMERICA.
CHIEFLY FROM THE SPANISH ARCHIVES.

PUBLISHED IN THE ORIGINAL, BY E. G. SQUIER, NEW YORK, 1860.

*Carta dirigida al Rey de España, por el Licenciado Dr. Don Diego García de Palacio,
Oydor de la Real Audiencia de Guatemala; Año 1576.*

RUINAS DE COPAN.

CERCA del dicho lugar como van á la ciudad de San Pedro, en el primer lugar de la provincia de Honduras, que se llama Copan, estan unas ruinas i vestijios de gran poblacion i de sobervios edificios, i tales que parece que en ningun tiempo pudo haver, en tan barbaro ingenio como tienen los naturales de aquella provincia, edificio de tanta arte i suntuosidad; es ribera de un hermoso rio, i en unos campos bien situados i estendidos, tierra de mediano temple, harta de fertilidad, é de mucha caza é pesca.

En las ruinas dichas, hai montes que parecen haver sido fechos á manos, i en ellos, muchas cosas de notar. Antes de llegar á ellos, está señal de paredes gruesas i una piedra grandísima en figura de aguila, i fecho en su pecho un quadro de largo de una vara, i en el ciertas letras que no se sabe que sea.

Llegados á las ruinas, está otra piedra en figura de gigante; dicen los Indios antiguas que era la guarda de aquel Santuario; entrando en el se halló una cruz de piedra de tres palmos de alto, con un brazo quebrado.

Mas adelante van ciertas ruinas i algunas piedras en ellas labradas con harto primor; i está una estatua grande de mas que quatro varas de alto, labrada como un obispo vestido de pontifical, con su mitra bien labrada i anillos en las manos. Junto á ella está una plaza muy bien fecha con sus gradas á la forma que escriben del Coliseo Romano, i por algunas partes tiene ochenta gradas, enlosada i labrada por cierto en partes de mui buena piedra é con harto primor; están en ella seis estatuas grandísimas, las tres de hombres armados á lo mosaico con ligagambas, é sembradas muchas labores por las armas, i las otras dos de mugeres con buen ropaje largo i tocaduras á lo Romano; la otra es de obispo que parece tener en las manos un bulto como cofreito. Devian de ser idolos, porque delante de cada una dellas havia una piedra grande que tenia fecha una piletta con su sumidero donde degollavan los sacrificados i corria la sangre; tambien tenian sendas cazolejas do sacrificavan con sus sahumeries, i en medio de la plaza havia otro pila mayor que parece de bautizar, donde

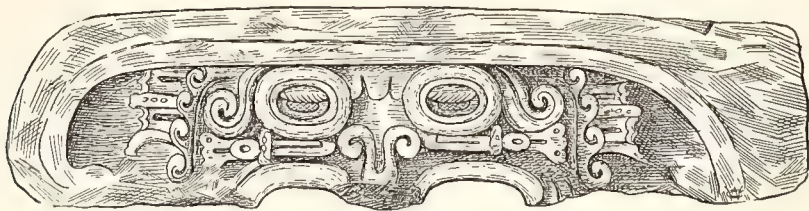
ansimesmo devian de hazer en comun sus sacrificios. Pasada esta plaza se sube por muchas gradas á un promontorio alto que devia de ser donde hacian sus *mitotes* i rictos; parece fue fecho i labrado con mucha curiosidad, porque aun siempre se hallan alli piedras muy bien labradas. A un lado deste edificio parece una torre ó terraplano alto que cae sobre el rio, que por alli pasa; hase caído i derrumbado un gran pedazo, i en lo caído se descubrieron dos cuevas debajo del dicho edificio muy largas i angostas, i fecho con harta curiosidad; no he podido averiguar de que servian é para que se hicieron; hay una escalera que baja hasta el rio por muchas gradas. Sin lo dicho hay muchas cosas que demuestran haver havido alli gran poder i concurso de hombres, é pulicia, i mediana arte en la obra de aquellas figuras i edificios. He procurado con el cuidado posible saber por la memoria derivada de los antiguos, que gente vivió alli é que saben é oyeron de sus antepasados, i no he hallado libros de sus antigüedades, ni creo que en todo este distrito hay mas que uno, que yo tengo; dicen que antiguamente havia venido alli i fecho aquellos edificios un gran señor de la provincia de Yucatan, i que al cabo de algunos años se bolvió á su tierra é lo dejó solo i despoblado, i esto parece que de las patrañas que cuentan es la mas cierta, porque por la memoria dicha parece que antiguamente gente de Yucatan conquistó i sujetó las provincias de Ayajal, Lacandon, Verapaz, i la tierra de Chiquimula, i esta de Copan, i ansi la lengua Apay que aqui hablan, corre i se entiende en Yucatan i las provincias dichas. I ansimesmo parece quel arte de los dichos edificios es como lo que hallaron en otras los Españoles que primeramente descubrieron la de Yucatan é Tabasco, donde hubo figuras de obispos, hombres armados, i cruces, i pues en ninguna parte se ha hallado tal, si no es en los lugares dichos: parece que se puede creer que fueron de una nacion los que hicieron lo uno i lo otro.

De los lugares dichos me volvi á Guatemala, porque con indisposiciones de algunos del Audiencia fue necessario para el despacho de los negocios, i ansi se mando lo hiciese, pase por lugares bien frios e fragosos donde ay los mayores i mas hermosos pinos i robles, cedros, cipreses, i otros muchos arboles que ay en todas estas provincias.

Estas son las cosas que en el discurso de la visita que hize por orden de V. M. me parecieron dignas de alguna consideracion; no pongo entre ellas la orden i particularidades de su gentilidad por ser muchas i requerir gran escriptura, aunque pudiera por tener hechas memoria de las mas dellas, siempre que V. M. me ocupáre en su servicio procuraré en lo general i en semejantes especialidades de manera que se entienda, que a lo menos tengo buen deseo.

Nuestro Señor la C. i R. persona de V. M. guarde muchos años con aumento de mayores estados i con felicimos sucesos! Desta Vuestra Ciudad de Guatemala, á 8 de Marzo de 1570 [1576] años. C. R. M. humilde i leal criado, que besa las reales manos á V. M.

EL LICENCIADO PALACIO.



SCULPTURE ON STEP OF HIEROGLYPHIC STAIRWAY. (See page 22.)

[TRANSLATION.]

RUINS OF COPAN.

NEAR here, on the road to the city of San Pedro, in the first town within the province of Honduras, called Copan, are certain ruins and vestiges of a great population and of superb edifices, of such skill that it appears they could never have been built by a people as rude as the natives of that province. They are found on the banks of a beautiful river, in an extensive and well-chosen plain, temperate in climate, fertile, and abounding in fish and game.

Among the ruins are trees which appear to have been planted by the hands of men,* as well as many other remarkable things. Before reaching them, we find remains of heavy walls, and a great eagle in stone, having on its breast a tablet a yard square, covered with unknown characters.

Arriving at the ruins, we find another stone in the form of a giant, which the ancient Indians aver was the guardian of this sanctuary. Entering the ruins, we find a cross of stone, three palms in height, with one of the arms broken off. Further on we encounter ruined edifices, and among them a number of stones sculptured with much skill; also a great statue more than four yards in height, which resembles a bishop in his pontifical robes with a well-wrought mitre on his head, and rings on his fingers. Near this is a well-built plaza or square, with steps or grades, which, from description, resemble those of the Coliseum at Rome. In some places it has eighty steps, paved, and made in part at least of fine stones, well worked. In this square are six great statues; three representing men with armor in mosaic, and garters around their legs. Their arms are loaded with ornaments. Two are of women, with long robes, and with head-dresses in the Roman style. The remaining statue is of a bishop, who holds in his hands a packet resembling a box or small trunk. It seems that these statues were idols; for in front of each of them is a large stone, in which is carved a small reservoir, with its groove, in which the blood was collected from the sacrifices. We find also the little altars on which the perfumes were burned before them. In the centre of the square is a large basin of stone, which appears to have served for baptism; and in which, also, sacrifices may have been made in common. After passing this square, we ascend by a great number of steps to a high place, which appears to have been devoted to *mitotes* and other ceremonies; it seems to have been constructed with the greatest care, for throughout we find the stones excellently well worked. On one side of this structure is a tower or terrace, very high, and dominating the river which flows at its base. Here a large piece of the wall has fallen, exposing the entrance of two caves or passages, extending under the structure, very long and narrow, and well built. I was not able to discover for what they served, or why they were constructed. There is here a grand stairway, descending, by a great number of steps, to the river. Besides these things there are many others which prove that here was

* Maudslay translates, "Mounds that appear to have been built by the hand of man," which is correct.

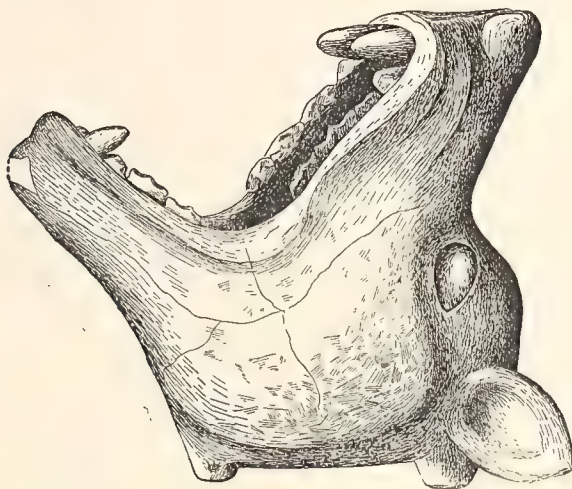
formerly the seat of a great power and a great population, civilized, and considerably advanced in the arts, as is shown in the various figures and buildings. I endeavored, with all possible care, to ascertain from the Indians, through the traditions derived from the ancients, what people lived here, and what they knew or had heard from their ancestors concerning them. But they have no books relating to their antiquities, nor do I believe that in all this district there is more than one, which I possess. They say that in ancient times there came from Yucatan a great lord, who built these edifices, but at the end of some years returned to his native country, leaving them entirely deserted. And this is what appears most likely, for tradition says that the people of Yucatan anciently conquered the provinces of Ayajal, Lacandon, Verapaz, Chiquimula, and Copan; and it is certain that the *Apay* language, which is spoken here, is current and understood in Yucatan and the aforesaid provinces. It appears, also, that these edifices are like those which the first Spaniards discovered in Yucatan and Tobasco, where there were figures of bishops and of armed men, as well as of crosses. And as such things are found nowhere, except in the aforesaid places, it may well be believed that the builders of all were of the same origin.

From the aforesaid places I returned to Guatemala, because some of the members of the Audiencia had fallen sick, and it was necessary for the despatch of business. In returning, I passed through places cold and rough, where there are the largest and most beautiful pines and oaks, cedars, cypresses, and many other varieties of trees, which are to be found in all these provinces.

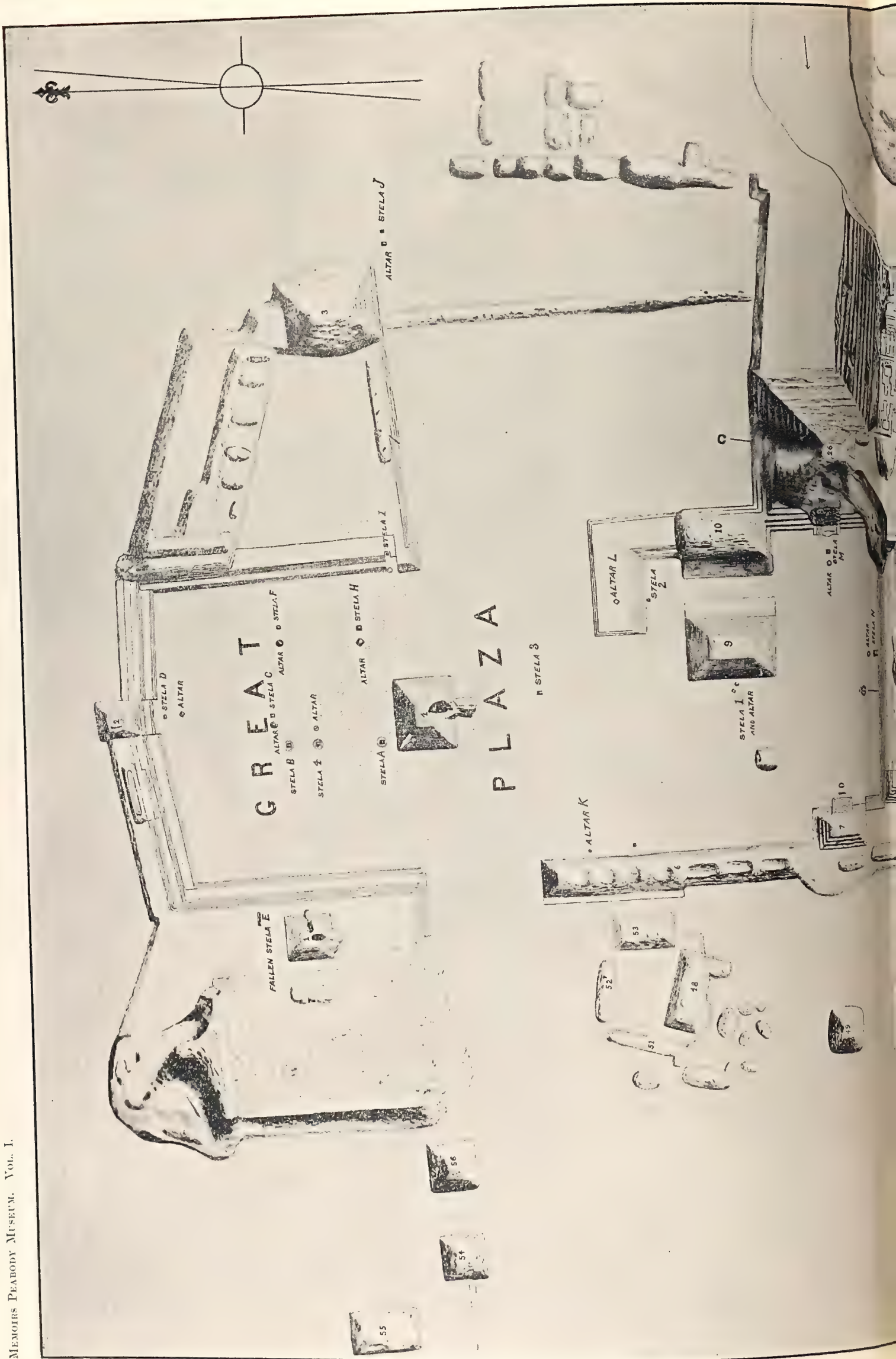
These are the most remarkable things which I discovered, in the visit which I made, under Your Majesty's orders. I have not recounted all that I learned of the Indians during the time of their infidelity, because it would make volumes; but I can give what I have retained in my memory, if Your Majesty thinks it useful, in such a manner, at least, as to prove my good-will.

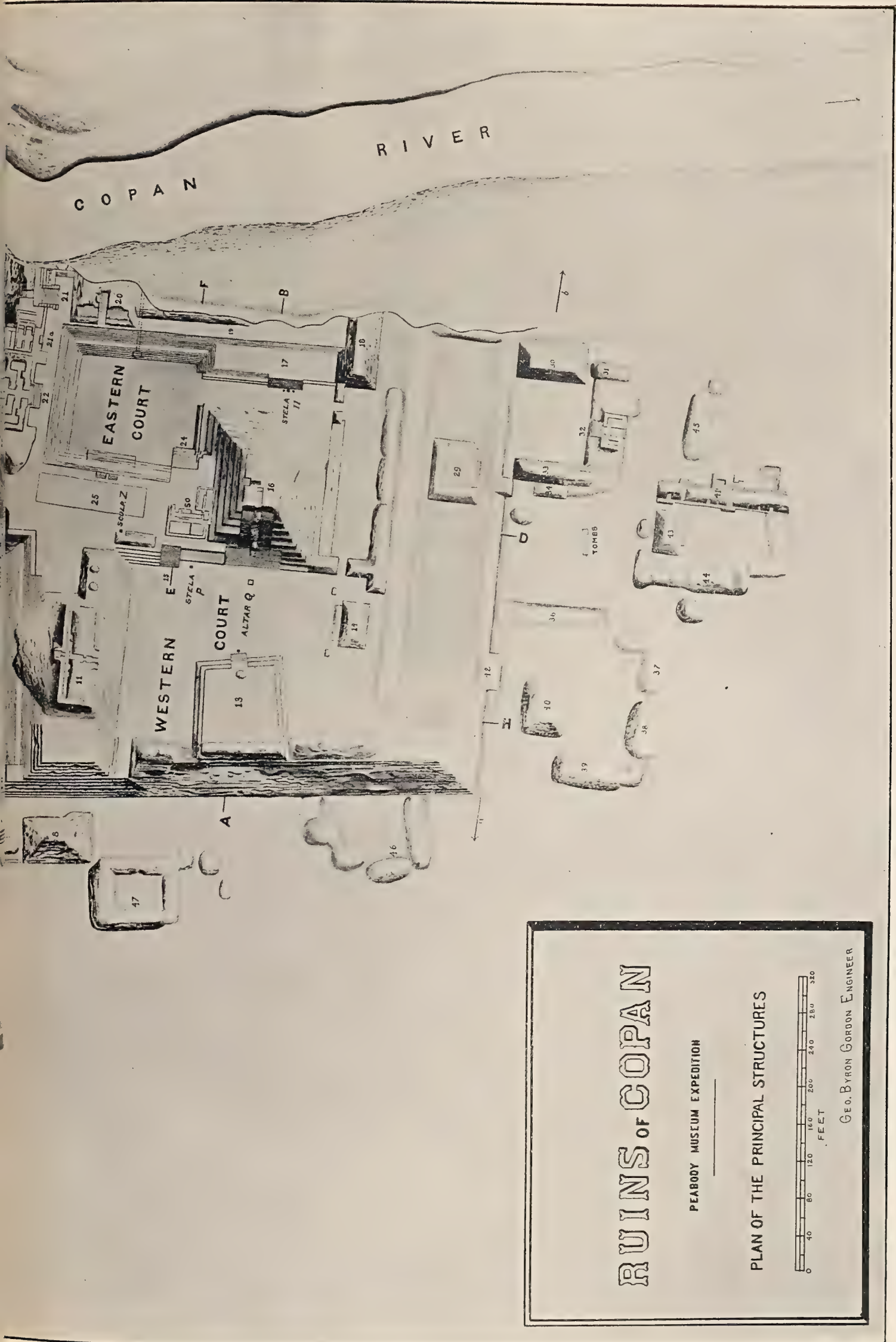
May Our Lord preserve Your Royal and Catholic person for many years, with augmentation of dominion, and with happy deeds! From Your city of Guatemala, March 8th, 1576. Your Royal Catholic Majesty's humble and loyal servant,

THE LICENTIAE PALACIO.



TERRA-COTTA VASE (3) FROM TOMB 1. (See page 30.)

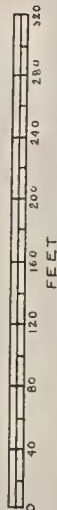




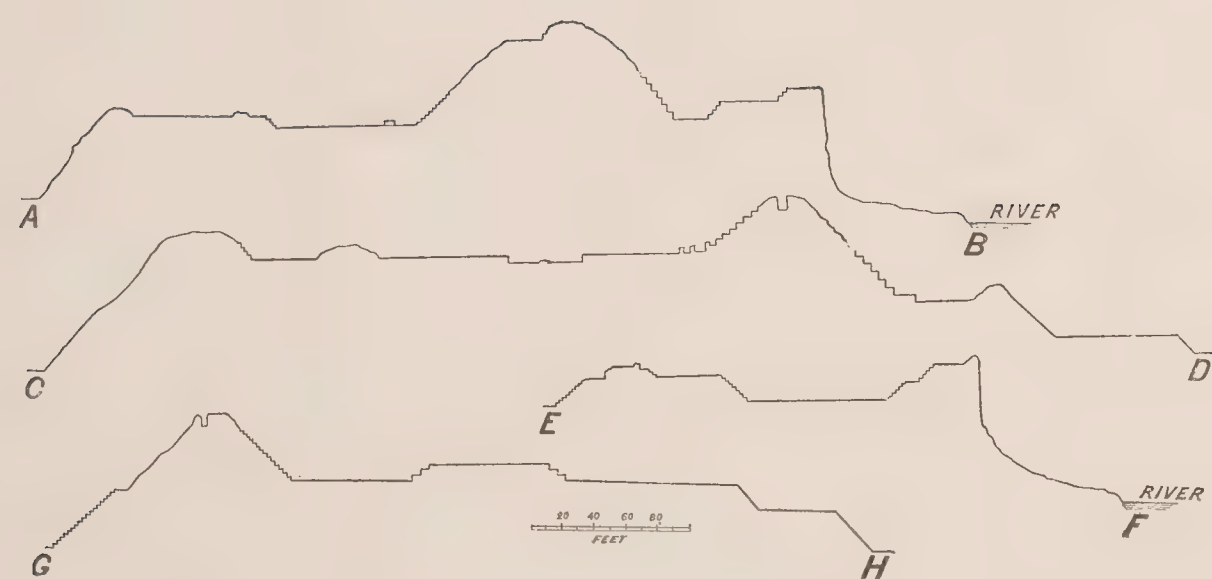
RUINS OF COPAN

PEABODY MUSEUM EXPEDITION

PLAN OF THE PRINCIPAL STRUCTURES



Geo. Byron Gordon Engineer



SECTIONS THROUGH MAIN STRUCTURE. See Plate I.

PLATE I. PLAN OF THE RUINS.

NUMBER.	CHARACTER OF RUINS.	LOCATION.
1 . .	Pyramidal Mound	West of Great Plaza.
2 . .	Pyramidal Mound	North of Great Plaza.
3 . .	Pyramidal Mound	East of Great Plaza.
4 . .	Pyramidal Mound	Great Plaza.
5 . .	Small Mound (not numbered on plan) . .	West of Mound 9.
6 . .	Oblong Mound with ruins of buildings upon summit	Southwest of Great Plaza.
7 . .	Pyramidal Mound	Southwest of Great Plaza.
8 . .	Pyramidal Mound	Northwest of Western Court.
9 . .	Pyramidal Mound	South of Great Plaza.
10 . .	Mound with angular northern extension .	South of Great Plaza.
11* . .	Mound with Temple upon summit . . .	North of Western Court.
12 . .	Stairway south of Mound 11 (number not given on plan)	North of Western Court.
13 . .	Raised Platform or Terrace	Western Court.
14 . .	Structure resembling the foundation of a building	Southern Part of Western Court.
15 . .	Stairway	Eastern side of Western Court.
16 . .	Pyramidal Mound with the remains of a Temple upon summit	East of Western Court.
17 . .	Terrace	South of Eastern Court.
18 . .	Oblong Mound	South of Eastern Court.
19 . .	Remains of part of a building	Southeast of Eastern Court.
20 . .	Pyramidal Mound with remains of a Temple upon summit	East of Eastern Court.
21 . .	Mound with ruined Temple upon summit .	Northeast of Eastern Court.
21 a . .	Building between Mounds 21 and 22 . .	North of Eastern Court.
22 . .	Mound with remains of Temple upon summit	North of Eastern Court.
23 . .	The Jaguar stairway (not numbered on plan = 24 of Maudslay)	West of Eastern Court.
24 . .	Stairway. (This is 23 of Maudslay's plan.)	Southwestern corner of Eastern Court.
25 . .	Probable stone foundation of oblong building	Elevation between Eastern and Western Courts.
26 . .	Pyramidal Mound once crowned with a Temple	North of Eastern Court.
27 . .	Hieroglyphic Steps on western slope of Mound 26	North of Eastern Court.
28 . .	Tunnel leading from Eastern Court to the river wall. (Not numbered on plan, but shown by dotted lines.)	East of Eastern Court.
29 . .	Terrace and Angular Mound	South of Pyramid 16.

* The same number is used to designate a Temple or the mound upon which it stands.

PLATE I. PLAN OF THE RUINS.— *Continued.*

NUMBER.	CHARACTER OF RUINS.	LOCATION.
30 to 35	Group of small Mounds, No. 32 having the remains of a building upon summit . .	Southeast of Pyramid 16.
36 to 40	Group of small Mounds	South of Western Court.
41 . .	Remains of a long building	South of Pyramid 16.
42 . .	Inclined Plane leading down from terrace .	South of Western Court.
43, 44, 45	Mounds forming portion of group . . .	South of Pyramid 16.
46 . .	Group of small Mounds	Southwest of Western Court.
47 . .	Mounds enclosing court. Probably the remains of stone houses	West of Western Court.
48 . .	The largest of a group of small Mounds .	Southwest of Great Plaza.
49 . .	Pyramidal Mound	Southwest of Great Plaza.
50 . .	Ruined Buildings	Northern side of Pyramid 16.
51 to 53	Small Mounds	Southwest of Great Plaza.
54 to 56	Small Pyramidal Mounds	West of Great Plaza.

STELÆ.	ALTARS.	LOCATION.
Stela A		North of Mound 4, Great Plaza.
Stela B		Near centre of Great Plaza.
Stela C	Altar of Stela C	Near centre of Great Plaza.
Stela D	Altar of Stela D	Northern part of Great Plaza.
Stela E		On Terrace west of Great Plaza.
Stela F	Altar of Stela F	Eastern part of Great Plaza.
Stela H*	Altar of Stela H	Eastern part of Great Plaza.
Stela I	Altar of Stela I	In niche at southern end of range of steps east of Great Plaza.
Stela J	Altar of Stela J	Near southeast corner of Mound 3, east of Great Plaza.
	Altar K	Near northern end of Oblong Mound southwest of Great Plaza.
	Altar L	Upon angular extension of Mound 10, south of Great Plaza.
Stela M	Altar of Stela M	Near foot of Hieroglyphic Steps, west of Mound 26.
Stela N	Altar of Stela N	At foot of steps north of Mound 11, north of Western Court.
Stela P†		Eastern side of Western Court.
	Altar Q	Eastern side of Western Court.
Stela 1	Altar of Stela 1	Western base of Mound 9, south of Great Plaza.
Stela 2		At southern base of angular extension of Mound 10, south of Great Plaza.
Stela 3		South of Mound 4, Great Plaza.
Stela 4	Altar of Stela 4	Near centre of Great Plaza.
Stela 11‡		In passage south of Eastern Court.

* G is used by Maudslay to designate a group of sculptures north of Stela H.
† O is a sculpture at foot of stairway leading to Mound 7.
‡ Stelæ 5, 6, 7, 8, 9, 10 are situated beyond the limits of the plan.

PLATE II.

FIG. 1. Main structure from eastern side of Copan River, looking north-northwest, showing underground walls of faced stone exposed by the undermining action of the river floods. Mound 16 is at the left, and the summit of Mound 20 is seen at the right of the centre of the illustration. (Pages 9-10.)

FIG. 2. Northeastern slope of Main Structure, looking southwest, showing, near centre of illustration, the elevations upon which stand Temples 21, 21a, and 22. To the right is Mound 26, and to the left is Mound 20 overhanging the river front. The stone wall in the foreground was built by the Peabody Museum Honduras Expedition for the protection of the ruins.



16

FIG. 1.

20



20

21

21a

22

26

10

FIG. 2.

PLATE III.

FIG. 1. From summit of Mound 26, looking south. Pyramid 16 is in the middle distance with walls of buildings (50) against its northern base. (Pages 13-15.)

FIG. 2. From summit of Pyramid 16, looking northeast. A portion of Eastern Court is seen with the northern flight of steps leading up to Temples 21, 21a, and 22. The northern end of the eastern flight of steps is covered by the débris from Mound 20 at the extreme right. The Jaguar steps (23) are at the left in the foreground. Mound 21 with its ruined temple is shown at the right above the flight of steps. Mound 22 at the left. Temple 21a occupies the space between 21 and 22. (Pages 17-19. See also Plate II. 2, and Plate IV. 1.)



FIG. 1



23

22

FIG. 2.

21a

21

20

PLATE IV.

FIG. 1. From summit of Mound 20, looking northwest. Remains of building (21a) between Mounds 21 and 22. Mound 22 with ruined temple is at the left, and a part of the western side of Mound 21 at the right. A portion of the great Plaza appears on the right in the middle distance. (Page 18. See also Plate II. 2, and Plate III. 2.)

FIG. 2. From northern base of Mound 20, looking northeast. Small chamber with square doorways built against southern terrace of Mound 21. Parts of the walls and doorways of a similar chamber are upon the terrace above. The steps at the right lead to a ruined Temple, the greater portion of which has fallen into the river. (Page 19.)



22

FIG. 1.

21a

21



FIG. 2.

PLATE V.

FIG. 1. A portion of the Hieroglyphic Stairway with a pedestal at base. Western side of Mound 26. (Page 21.)

FIG. 2. Blocks from two steps of the Hieroglyphic Stairway, showing a broken sculpture representing a reclining human figure in central part of stairway. (Page 22.)



FIG. 1.



FIG. 2.

PLATE VI.

FIG. 1. Looking northeast from northern side of Great Plaza. Stela D and Hieroglyphic Steps at base of stairway on southern side of Mound 2. (Page 24. The Altar of Stela D is represented on page 43.)

FIG. 2. Great Plaza, looking northwest from summit of Mound 26, showing flights of steps upon eastern, northern, and western sides, and the position of Stelæ and Altars. The western arm of the extension north of Mound 10 is in the foreground with Stela 2 at its southern base, and Altar L upon the level area forming its summit. Mound 4, excavated by Maudslay, is at the left of the centre of the illustration, and a short distance in front is the fallen Stela 3. Stela A is hidden by Mound 4, and the fallen Stela 4 lies just beyond the Mound and near the Circular Altar. The broken Stela C and Altar mark the centre of the illustration. Stelæ B, D, F, and H are standing and are designated by the letters near the lower margin of the figure. Fallen Stela E lies upon the terrace above the western range of steps just north of Mound 1. (Page 23.)



FIG. 1.



3 2 L 4 B C D H F

FIG. 2.

PLATE VII.

FIG. 1. Stela 6. Front.

FIG. 2. Stela 6. Back.

FIG. 3. Stela 6. Eastern side.

FIG. 4. Stela 6. Western side.

(Page 37.)



FIG. 1.



FIG. 2.



FIG. 3.



FIG. 4.

PLATE VIII.

FIG. 1. Portion of Stela 11 adjoining right side of human figure.

FIG. 2. Portion of the same stela showing human figure.

FIG. 3. Portion of the same stela adjoining left side of human figure.

FIG. 4. Portion of the same stela between parts 1 and 3.

(Page 38.)



FIG. 1.



FIG. 2.



FIG. 3.



FIG. 4.

PLATE IX.

FIG. 1. Head of "Singing Girl" sculptured in trachyte. From débris of Temple 22.
(Page 18.)

FIG. 2. "Singing Girl" sculptured in trachyte. The left hand, with a portion of the wrist, is broken off; and the greater part of the headdress, which was similar to that of Fig. 1, is also missing. From débris of Temple 22. (Page 19.)

FIG. 3. Portion of a figure sculptured in trachyte. From slope north of Temple 22.
(Page 19.)

FIG. 4. Seated figure sculptured in trachyte. From débris of Hieroglyphic Steps.
(Page 22.)

These sculptures are slightly larger than life size.



FIG. 1.



FIG. 2.



FIG. 3.



FIG. 4.

MEMOIRS
OF THE
PEABODY MUSEUM OF AMERICAN ARCHAEOLOGY AND
ETHNOLOGY, HARVARD UNIVERSITY.

VOL. I.—No. 2.

CAVE OF LOLTUN,
YUCATAN.

REPORT OF EXPLORATIONS BY THE MUSEUM, 1888-89 AND 1890-91.

BY
EDWARD H. THOMPSON.

CAMBRIDGE:
PUBLISHED BY THE MUSEUM.
1897.

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EDITORIAL NOTE.

DURING a visit to Yucatan in 1888, Mr. Charles P. Bowditch was impressed with the importance of archaeological research in this land of ancient culture. On his return to Boston, he interested several friends of the Museum to join him in the project of carrying on explorations in this region under the auspices of the Museum. Mr. Edward H. Thompson, who, as United States Consul to Merida, had been living in Yucatan for several years, was engaged to direct and to conduct the work on the part of the Museum.

The first expedition left Merida on December 3, 1888, for the Ruins of Labná, where the work was carried on during the winter and spring. The second expedition started in the autumn of 1890, and continued the exploration of these ancient ruins for several months. Important discoveries resulted from the explorations, and many interesting photographs and moulds were secured. A survey was made and a plan drawn of the group of ruins. A report on the Ruins of Labná was prepared by Mr. Thompson, but circumstances have not yet permitted its publication.

On the first page of this Memoir is a small outline map of Yucatan showing the relative position of the principal ruins and of the Cave of Loltun.

Mr. Henry N. Sweet, photographer, and Mr. Clifton H. Paige, civil engineer, both of Boston, arrived at Merida the last of November, 1888, and the expedition soon started for the Cave of Loltun on the way to Labná. Here for some days during the heavy rains the explorations were carried on. Photographs of different parts of the cave were taken, several of which are reproduced in the plates accompanying the following report. A survey was made of portions of the cave, and a few of the plans are reproduced in the following pages.

The second expedition to the Cave of Loltun was in December, 1890, when several passages and chambers, not previously entered, were examined. On this expedition Mr. Marshall H. Saville, of the Peabody Museum, assisted Mr. Thompson in the explorations. Additional photographs were

taken by Mr. Saville. The most important of these is the sculptured human figure which is here reproduced as Plate VI. On Plates VII. and VIII. are photographic reproductions of numerous objects found in the cave, and referred to in the text. A few other cave specimens of peculiar interest are shown in the text by drawings made by Mr. C. C. Willoughby.

The discovery of filed teeth in the cave is of particular interest, owing to the fact that these teeth are filed in the same manner as those in a skull found under one of the ruined buildings at Labná. Similarly filed teeth have been found in several other places in Mexico; and they evidently represent a peculiar custom of a certain group of the ancient Mexicans. The ethnic importance of the several styles of filing and ornamenting teeth, as shown by specimens in the Museum, will be considered in a special paper.

As the manuscript for this report was prepared by Mr. Thompson in 1891-92, it is thought best to print it without any reference to the recent explorations in this cave by Mr. Henry C. Mercer. It will be seen that Mr. Thompson was the earlier explorer, although the publication of his report has been so long delayed. It is due to Mr. Thompson to state that, owing to his residence in Yucatan, he has not had the opportunity to revise the proof of his report.

F. W. PUTNAM,
Curator of the Museum.

HARVARD UNIVERSITY, CAMBRIDGE,
MAY 26, 1897.

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CAVE OF LOLTUN.

REPORT OF EXPEDITION OF 1888-89.

AFTER a week of preparation in Merida, the members of the expedition* went on to Ticul where they were heartily welcomed by Don Antonio Fajardo whose genial face and kind courtesy are most pleasing remem-

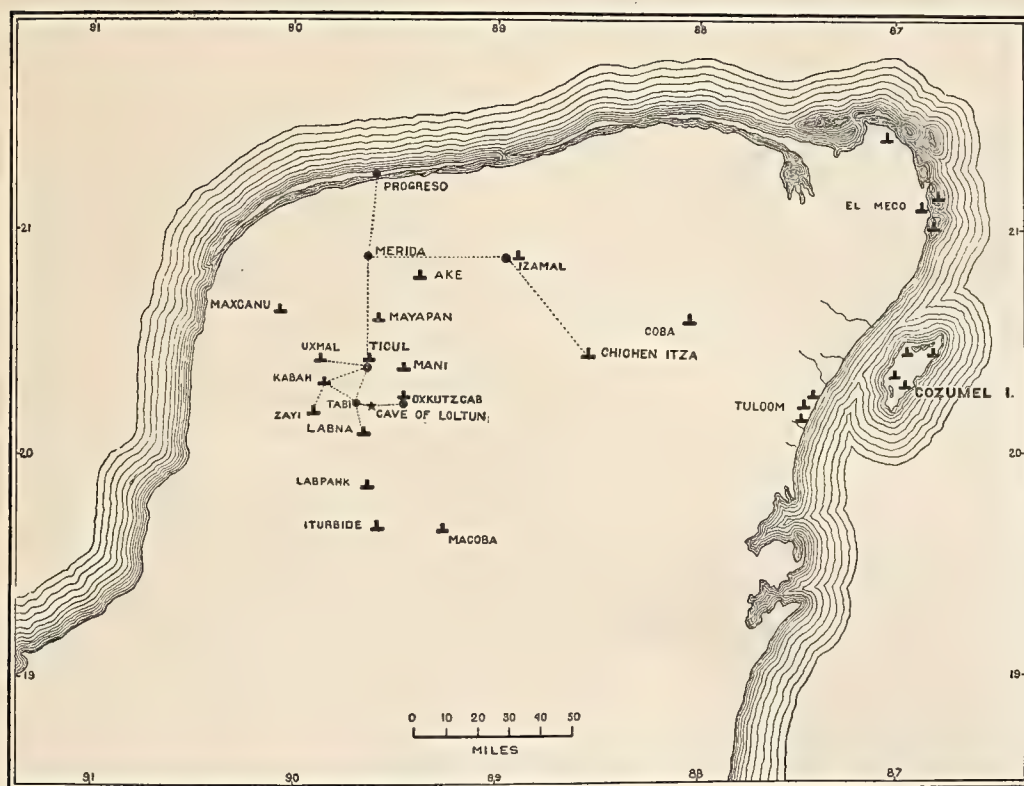


FIG. 1. — MAP OF YUCATAN.

The dotted lines show routes taken by the Peabody Museum Expedition of 1888-1891.

brances of the winter's work. Having partaken of an excellent dinner with his pleasant family, we entered the volans, each drawn by a trio of mules, and were soon on our way to the frontier hacienda of Tabí, whose

* Consisting of EDWARD H. THOMPSON, *Director*; H. N. SWEET, *Photographer*; CLIFTON H. PAIGE, *Civil Engineer*.

long fields of sugar-cane fringe the line between civilization and the wild lands.

Arriving at Tabí, sixteen miles to the south of Ticul and sixty-eight to the south of Merida, where the kindness of Señor Fajardo had placed everything at our disposal, a midnight lunch was served, and hammocks were called into requisition. During the night there were heavy showers. The next morning the cloudy skies promised more rain, but although the forests paths were flooded, we were unwilling to lose valuable time and determined to press on. The Cave of Loltun, situated a league to the east of Tabí, was one of the places to be investigated. Once in the cave, the state of the weather would be a matter of indifference to us. The work could go on without loss of time. Candles, ropes, and provisions were therefore packed, all due preparations made, mules obtained, and before many hours the members of the expedition were at work, each in his department, nearly a hundred feet underground.

Loltun, or the cave of the flowers of stone (Plate I. Fig. 2), is the poetic name given to this cave by the natives. In a region more accessible to tourists it would be world-famed. Its long passages, buried in the depths below, dark as a tomb and as silent, suddenly open into roofless grottos, sun-lit from above, framed in by huge tree-roots and vines, and perfumed by thousands of flowers, that, nourished by the rich, damp soil below, are quickened into fragrance and beauty by the hot sun's rays descending from above.

Several of these grottos, when the sun's rays have the right inclination, are suffused with tints of pale green or rose, rivalling in beauty the famed Blue Grotto of Capri. There are, it is said, eleven of these openings, or mouths, through which the sunlight descends and creates a veritable fairy land.

Entering a mouth, an ancient entrance (Plate I. Fig. 1), as is evidenced by the much-worn stone path-way, the descent is made by primitive ladders, — tree-trunks felled and placed in position, with rounds made from the tree limbs which, placed in notches cut in the tree-trunks by the aid of machetes, are firmly bound in place by the running vines or bejucos that grow in profusion around the spot.

Arriving at the bottom, after the eyes are accustomed to the twilight effect of the surrounding atmosphere, various evidences of man's previous occupation are seen in the *haultunes*, or water troughs, hollowed out of stone boulders, some holding a quart, others several gallons of the water that, drop by drop, percolates through the roof of the cave. On several sides are constructions that tell of defence and war, barricades roughly built but strong and admirably placed to defend the entrance and prevent surprise to those within (Fig. 2).

This cave, the natives tell me, was used as an occasional refuge

by the Indians during the "War of the Races" in 1847, and these barricades may have been constructed by them at that period, but I doubt it. I believe that, while they may have been made use of by these refugees, they were constructed at a much earlier date, probably by the same people who inscribed the hieroglyphs and symbols upon the walls and boulders of the Inscription Chamber (Chamber 3) to be described further on.

I find the lowest stones of these barricades to be, on an average, buried about eight inches below the present floor. This was not because a slight excavation had been made within which to place the foundation stone, and that a comparatively slight subsequent accumulation had served to give the depth, for careful examination showed that the stones had been simply laid upon the surface and the barricade erected with a front filling of stone rubble. The material which accumulated above and around these base stones may safely be said to have accumulated since their construction, not, as in the case of the ruined edifices, since their disuse or destruction.

In this accumulation are found quantities of potsherds. The first four inches from the level of the present floor contains comparatively few, except where the action of running water had changed the natural order of things. The remaining four inches, extending down to the ancient floor upon which the barricades rest, contains large quantities of them. Most of these potsherds are undeniably of ancient origin.

These barricades were probably garrisoned by persons constantly on guard to prevent surprise. This garrison, naturally, used clay vessels for many purposes; their food was cooked and probably brought to them in clay vessels; these, by accident, became broken, and the larger fragments were used as receptacles, as is the custom to-day; the remainder were trampled underfoot as refuse, and became a part of the general accumulation. When the cave was abandoned, the accumulation went on, but free of potsherds, and only by agencies in which the hand of man had no part.

Thus we can believe that the layer of material plentifully mixed with

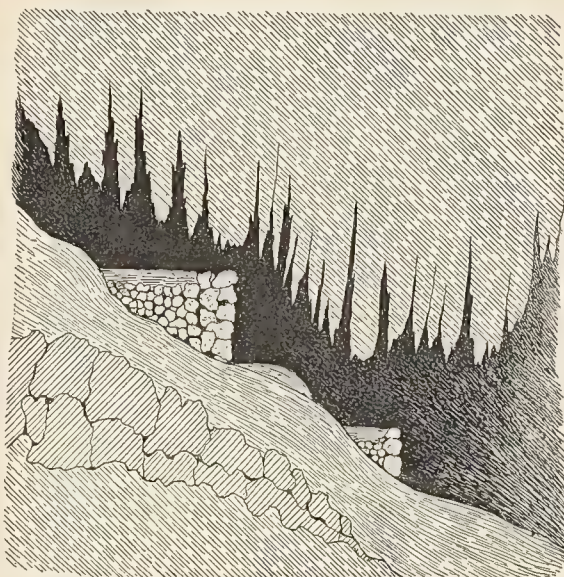


FIG. 2. — VERTICAL SECTION, SHOWING BARRICADES.

potsherds represents the intervening period between the construction of these barricades and their abandonment as a defence; and, as I have noted, this act was probably coeval with the abandonment, as a habitation, of the cave itself. The layer free from potsherds would then represent the intervening period between the date of abandonment and the present day.

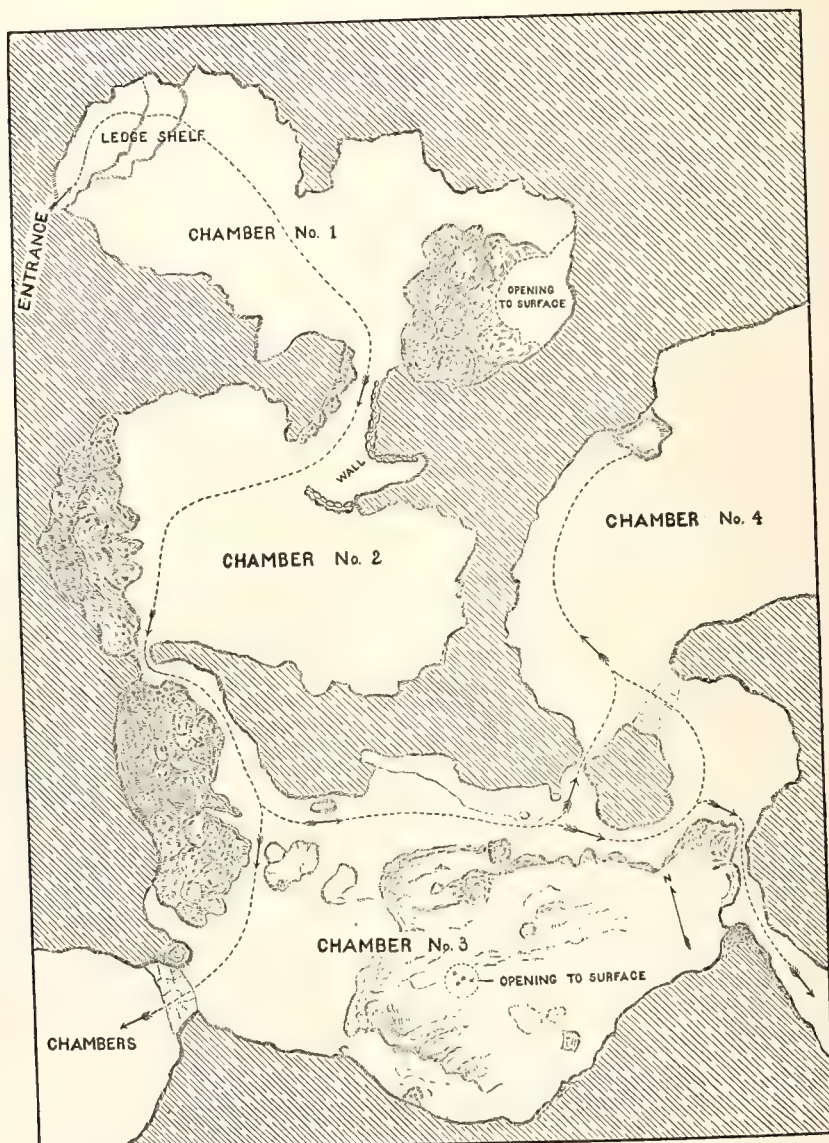


FIG. 3. — PLAN OF THE PRINCIPAL CHAMBERS OF THE CAVE OF LOLTUN.

It is to be remembered that while the two portions of the accumulation before mentioned are of equal thickness, each four inches, it does not follow that equal periods of time were necessary to produce them. As a factor in the process, man would undoubtedly, by his movements and the pressure of his feet, render the accumulation more dense and compact



FIG. 4.—PLAN OF CHAMBER 3 (INSCRIPTION CHAMBER), CAVE OF LOLTUN.

than would the constant, yet gentle, pressure exerted by the natural weight of the material of the stratum under normal conditions.

Thus four inches of accumulation effected when man was a factor might well indicate the deposition of double the actual material contained in the four inches of accumulation effected when man was not a factor. On the other hand, the very presence and needs of man cause depositions to accumulate, when not removed, at a rate much greater than by the normal processes of nature.

Passing through chambers 1 and 2 (Fig. 3), we entered a passage-way, the floor and walls of which are of a burnt-umber color, and absolutely non-reflective, making a gloom that the torches and candles seemed only

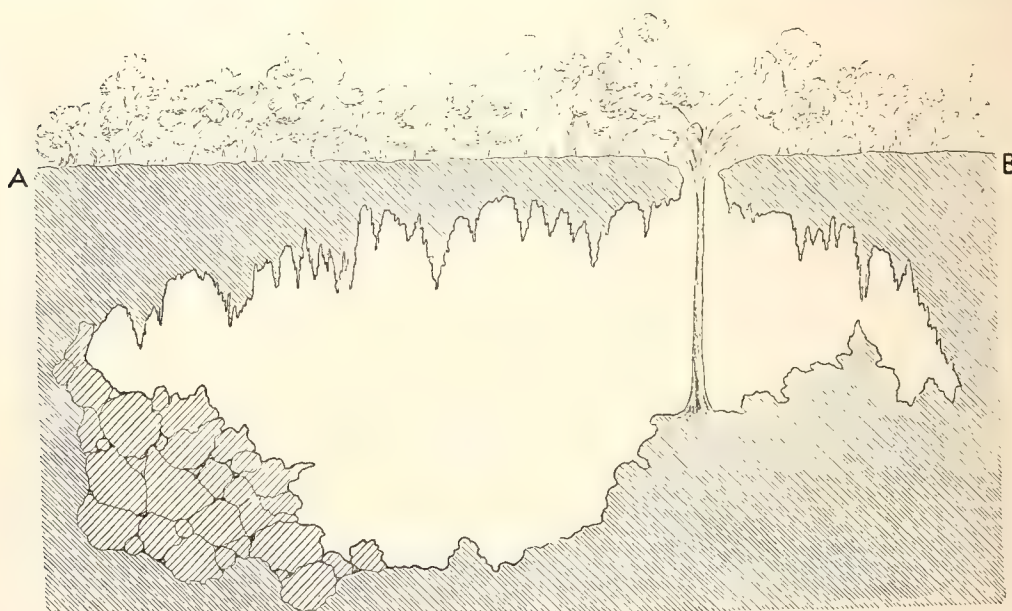


FIG. 5. — VERTICAL SECTION THROUGH CHAMBER 3, CAVE OF LOLTUN.

to emphasize and not to illumine. This passage-way opens into Chamber 3. In the southern portion of the domed roof there is an immense circular opening, and through it the light passes and illuminates the chamber that would otherwise be in impenetrable darkness. This we named the "Inscription Chamber" because of the inscriptions and devices carved upon the walls and boulders.

At the very entrance of the chamber (Fig. 4), the vertical wall is covered to the height of six feet with lines of hieroglyphs (Plate II. Fig. 1). These were probably never engraved very deeply into the stone surface of the wall, and are now in places rendered almost invisible by the disintegration of the surface of the rock. In many places in the cave the exceedingly low relief of the inscriptions could be explained by the theory that the same agencies that produced the stalagmites, and covered the

walls with a coating of lime, coated the inscriptions, also, and thus reduced them to scarcely perceptible outlines. But the inscriptions in Chamber 3 appear to have been carefully engraved upon certain portions of the walls where the accumulation was not forming. A thin coating of green mould one-eighth of an inch thick is the only formation that tends to hide them from view or lower their relief. If any inscriptions were engraved on the portions of the walls where the deposition of lime was taking place, all signs of them have disappeared.

These inscriptions are in partial obscurity; the entrance path winds directly in front of them, so near that, even without the instinct to press close to a solid guiding surface while in the darkness, the passer-by would brush against them, and thus aid in the erosion of the surface and gradual effacement of the characters upon it.

Entering the chamber itself, and continuing to follow the line of the left-hand wall, various devices are seen carved upon its surface, ending in a series of hieroglyphs or symbols (Inscription 2) at the extreme end of the inscribed wall surface. These are placed about six feet above a large boulder, upon the sides of which rough steps had been hewn (Plate III. Fig. 1).

About eighty feet to the southeast of this boulder is a large rock upon which is Inscription 4, a and b (Plate IV. Figs. 1 and 2). A short distance to the northeast of Inscription 4, upon a boulder beneath the overhanging rock, is Inscription 3 (Plate V.); while upon the rising ground to the south, and nearer to the opening in the roof above, are other boulders bearing graven characters and unknown symbols (Inscriptions 5, 6, and 7). As the graven devices mentioned above are much more clearly shown by the accompanying photographs than they would be by any words or drawings of mine, I shall not attempt a detailed description (Plate II. Fig. 2, Plate III. Fig. 2). A peculiar character carved upon the eastern face of one of the boulders (Inscription 4, a) merits special attention and has caused me much thought. Its peculiar contour and general character almost irresistibly impel me to believe that it indicates a body swathed in mummy clothes (Plate IV. Fig. 1); and yet nowhere else in my researches among the vestiges of prehistoric man in Yucatan have I found aught that would lead me to believe such a custom ever existed in Yucatan.

It is also a fact that these cave chambers have innumerable niches and cavities, many of which still retain an evidently artificial form. These would be the places most suitable for the deposition of the bodies or mummies.

One cavity in particular attracted my attention. It was in the centre of a huge stalagmite that rose from the floor until it joined an almost as large stalactite pendent from the roof above. At a distance of eight feet from the surface upon which the stalagmite rested, I noted an orifice, evi-

dently shaped by human hands, in the centre of the surface of the stalagmite, in such a position that it faced the opening in the roof through which the light entered. Ascending close to it in order to examine it, I found that the orifice opened into a cavity just about large enough to hold a human body. The floor of this cavity was reasonably smooth, and the whole appearance was such as to lead me to believe it to have been a work of nature aided very much by the hand of man.

Surface material, twigs, beetle wings, bat excrement	2 inches
Cave earth	2 "
Dark brown cave earth, mice and bat bones	4 "
White ashes, potsherds, small animal bones	2 "
Brown earth, potsherds	6 "
Red and white ashes, potsherds, sea-shell	5 "
Calcined lime-rock, potsherds	7 "
Mixed earth, ashes and stones, potsherds and flint chips, obsidian	11 "
Rock fragments, earth, pottery (rare)	57 "
Rock fragments, ashes, flints, potsherds	5 "
Large fragments of rock	

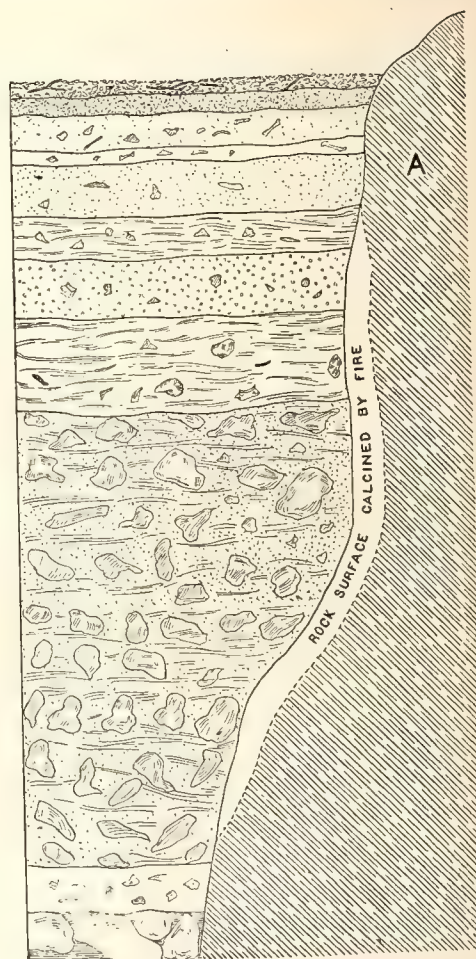


FIG. 6. — VERTICAL SECTION SHOWING LAYERS EXPOSED BY EXCAVATION No. 1.
Scale, $\frac{1}{2}$ inch = 1 foot.

In none of these cavities, of which I examined more than a hundred, did I discover any traces of human remains. If any had been placed within they had been removed before I made my examination.

I made an excavation (No. 1) close by the rock upon which the device described as resembling a mummy had been carved. This excavation (Fig. 6) had a length of ten feet and a breadth of six feet directly in front of the carving. The first layer of surface accumulation excavated was two inches deep, and consisted of twigs and leaves blown in by the winds

that eddied in the huge opening above; with these were half-gnawed nutshells, fruit seeds brought in by cave mice and by fruit-eating bats, and bat excrement.

Buried in this accumulation, eight-tenths of an inch below the surface material of the cave, we encountered a small disk of iron, thin and with a hole in its centre. It resembles very much the eye of a rivet, and its presence can probably be explained by the fact of its once having formed a part of the gun of a refugee, or of some native hunter who entered the cavern to hunt the jaguars or the immense serpents that the natives say hide in the abysses that abound on every side.

The second layer, also two inches deep, is of the same general nature as the first, but more decomposed and dustlike.

The third layer, four inches deep, is of dark-brown earth, damp and mixed with stalactite tips and the ever-present bones of bats and cave mice.

The fourth layer, two inches deep and well defined, consists of pure white ashes, in which were encountered potsherds, and close by pieces of bones of small animals not charred by fire. The potsherds are of the plain and striated pattern found in abundance throughout the excavations among the ruined buildings.

Below this stratum of ashes occurs a layer of six inches of brown earth, followed by a second stratum of red and white ashes from three to five inches thick, much intermixed with earth, bits of lime-rock, potsherds, and bones of small animals; in this mixed matter were found a tooth of an animal and a sea-shell. This layer of ashes had evidently been subject to some disturbing influences; the earth immediately under and above had been ground into and well mixed with it, thus making it a difficult matter to ascertain where the line of ashes began and ended.

A layer of seven inches of lime-rock, decomposed by fire and intermixed in plentiful confusion with potsherds of the usual plain and striated patterns, then intervenes, followed by eleven inches of ashes, earth, and lime-rock. At this point the inclined plane of the rock (A) shows unmistakable signs of having been at some period subjected to such a heat that a large portion of its face has been converted into soft and friable, calcined stone. Below the last mentioned layer was one of earth, ashes and stones, in which were found a piece of an obsidian knife (no obsidian exists naturally in Yucatan), a cylindrical bead of burned clay of a jet-black color, a sea-shell, and many pieces of pottery.

In the succeeding 57 inches of deposit there was a simple commingling of lime-rock, fragments of earth, and very rarely a piece of pottery.

At a depth of eight feet from the surrounding surface was encountered an irregular layer of ashes having an average depth of five inches. These ashes were compressed by time, and the superimposed accumulations, into

hard, compact laminations that seemed to have been the result of many fires. Directly under these ashes, in fact, embedded in the lower stratum, were found various potsherds, plain and striated ware, and several chipped flints. No trace of bone or any organic matter exists within this stratum of ashes, so far as we could ascertain.

Below this last layer of ashes was encountered a mass of rock fragments and boulders. Penetrating into this to a depth of two feet, nothing of interest was found, and for the time, at least, this excavation was abandoned.

The above excavation is one of nine, all yielding practically the same results down to a depth of four feet, when in the majority of cases the evidences of man's handiwork ceased.

In an excavation made in front of the large boulder that faces Inscription 2, at a depth of twenty-six inches below the present cave bottom, we encountered a peculiar object of hard-burned clay, possibly a stamp or seal. This object is circular, a little over one and a half inches in diameter, with a flat face and reverse plain, with a knob in the centre as if to serve as a handle. On the flat face is incised a spiral pattern, and its edges are scalloped (Plate VII. Fig. 1 a). This device, or symbol, in its convolutions bears a considerable and probably intentional resemblance to certain of the devices that appear carved on the rocks and boulders around, and upon the wall of the chamber. What signification this peculiar symbol has, is to me unknown; but, from the presence of some bright red pigment in the convolutions, I am inclined to believe that it was used to stamp the emblem upon some other object. This red pigment is possibly vermilion, as Mr. Alfred Maudslay assures me that he has found both the vermilion and the metal mercury in the ruined groups of Quirigua and Copan.

In making these excavations, great care was taken that the work should proceed in such a manner, and in such locations, that no false conditions could exist to injure the value of the information gained.

For example: the rains, as they fell, evidently entered the huge opening above in torrents, and, in certain localities, washed all before it, thus disturbing the natural arrangement of the accumulations, and, to a certain depth, mixing everything in inextricable confusion. Moreover, evidence was not wanting to show that, in times past, other water-sheds had been formed, and that water once flowed down the descending sides of the high portions of the accumulations upon the floor of the chamber in different channels than at present. This change may have been artificially produced by the inhabitants of the cave; but I believe that it was generally caused by the falling of masses of material from above, whereby, the old channels becoming choked up, the water was forced into others. As the object of this expedition was to observe the actual deposits as they

were originally formed, the places where this erosive action, whether of the past or present, was noted, were avoided.

It is worthy of note, as an interesting fact in connection with the query as to the amount of time necessary to produce such an accumulation of ashes, that Chamber 4 is considerably lower than Chamber 3; consequently, the rush of water during the rainy season washes from Chamber 3 down and into Chamber 4, where it is lost in the deep chasms that abound on all sides. The entire bed of the torrent is one solid mass of wood ashes and charcoal, almost free from earthy matter, but containing great numbers of potsherds, and I doubt not, if thorough search was made, many other interesting articles could be found embedded in the compact mass. It is several feet thick and of unknown width and length. It is covered with a superficial accumulation of *brown earth*, two feet deep.

In the passage-way, or sub-chamber, connecting chambers 3 and 4, is a beautiful work of nature. The native who first showed it to me called it the "baptismal font," and the name is very appropriate. A cylindrical pedestal of glistening, snowy-white material, with fluted sides and base, stands close by the wall of the passage. The centre of this column is hollowed, and in its beautifully curved top a cup-like cavity is formed, half shielded by



FIG. 7. —HALTUN, OR STONE WATER-TROUGH, COVERED WITH STALAGMITE.

a transparent veil of stalagmite. Not a drop of water is said to enter the cup from above, and yet it is always full of cold water, and the sides of the column are never free from the overflowing moisture. A reservoir, or conducting canal, naturally formed in the wall, contiguous, undoubtedly connects with it, and thus keeps it perpetually filled with water of almost an icy coldness. This phenomenon of naturally produced cold water, in a land where the water as it bursts forth in springs is actually tepid, would, if near to Merida, bring a fortune to its lucky owner. As it is, none but the occasional Indian sees the beauty of the reservoir and enjoys its refreshing contents.

In this passage-way, or sub-chamber, is a second phenomenon of considerable interest, and in this the hand of man can claim to have exerted a controlling influence. A large "haltun," or stone water-holder, holding several gallons, had in the unknown past been raised upon a base of

several large stones until it was at an altitude of four feet from the cave bottom of to-day, and directly under a spot where the drops of percolating water fell; in time the percolation not only filled the haltun with water, and thus supplied the means with which to quench the thirst



FIG. 8. — ROCK CARVINGS, CAVE OF LOLTUN. $\frac{1}{8}$.

After tracing by E. H. Thompson.

of the cave-dwellers, but coated the whole structure — base stones and haltun inside and out — with a transparent and thin, but constantly increasing, coating of lime. To-day the structure stands, a solidified, rounded mass of white lime. Through the several inches of transparent envelope the ancient haltun can still be seen.

Within the northern wall surface of Chamber 3, there is a small opening leading into a large cavity, in fact a small chamber capable of holding comfortably several persons. The opening from the large chamber into this small one is skillfully barricaded and made smaller by large

stones so arranged as to appear to be the work of nature, and this effect is heightened by the uniform film of mould dust that covers all the lower portion of the cave. In one corner a haltun, or water-trough, had been cunningly sunk into the floor surface and projected so far each way that the water dripping constantly from the stalactite points of the outer wall could be utilized by the occupants of the chamber without detection or exposure. In another corner, charred wood and ashes were found, beside postherds and flint chips. This instance is but one of many similar ones that are seen in the chambers of the cave.

I have found a great many of these haltunes in various portions of the cave. Chamber 3 contains the largest number of any of the chambers I have visited.

In order to furnish data for the future worker, we took a haltun of ordinary size, the present location of which is about twenty-five feet northwest of Inscription 7, and carefully removed the crystalline envelope of

lime. This coating, two and one-half inches thick upon the outer rim of the cavity, three and one-half inches thick on the inner bottom, and one and one-fourth inches thick upon the outside structure of the haltun itself, was removed with considerable difficulty. This accomplished, the legend "E. 1888" was



FIG. 9. — ROCK CARVINGS, CAVE OF LOLTUN. $\frac{1}{8}$.

After tracing by E. H. Thompson.

chiselled in letters half an inch deep upon the side of the haltun nearest the passage-way. The haltun was then restored to its original position, and left until succeeding years, possibly centuries, and renewed deposit shall make it serviceable to science by recording the rate of stalagmitic deposit.

The entire year might be spent in this cave with good results to science; but it was not deemed advisable to spend a long time during one season in the cave. Constant exposure to the cold, damp air and the sudden changes of temperature, as each day the laborers ascended and descended, caused coughs and colds until, from pure humanity for the health of our faithful natives, we were forced to leave cave work, and migrate to the high and drier region surrounding the Labná group.

REPORT OF EXPEDITION OF 1890-91.

DECEMBER 1st of the season of 1890 found us again at the cave.*

The engineering work done by Mr. Paige, and the excellent photographs made by Mr. Sweet, during the previous season, enabled us to get started on direct investigation in a very short time.

About half-way down the descent from the surface to the first chamber, there is a ledge shelf, or cleft, so deep and sheltered as to be



FIG. 10.—PERFORATED SHELL. $\frac{1}{4}$.
Ornament.



FIG. 11.—PERFORATED SHELL. $\frac{1}{4}$.
Ornament.

almost a chamber. This seemed a promising field for investigation, as its position would naturally lead us to expect fruitful results.

Carefully dividing the shelf floor into sections, for systematic investigation, we commenced the excavation. The earth as it was dislodged was carefully inspected *in situ*, and the sides of the cuts carefully examined and worked into with hand, brush, and small trowel. The observations were minutely made and noted, and the loose earth was carefully sifted.

* The expedition this season consisted of EDWARD H. THOMPSON, *Director*, and MARSHALL H. SAVILLE, *Assistant and Photographer*.

The accumulated deposit upon the shelf was naturally much less in depth than that upon the chamber floor. In no spot was it over three feet, and the average depth from surface to bed-rock was one foot and three inches; for the first three inches it was a composite of bat excrement, bird feathers, mole, bat, and rat bones. Potsherds, few in number, were found where the rains had worn away the upper deposit of material.

The second three inches consisted of fine dust, stalactite tips, small animal bones, and many teeth and snail-shells.

Beneath these two superficial deposits commenced the actual traces of the ancient people who made this cave, if not a home, at least a station in their life's journey.

The contorted surface of the floor of the shelf made any epoch-marking stratification impossible.

FIG. 12.—ORNAMENT
CARVED FROM SHELL. $\frac{1}{4}$.

Beneath this detritus of six inches was a thick stratum of mingled earth, potsherds, and fragments of rock. At a depth of five and ten inches beneath the surface of this deposit I thought I could detect somewhat regular deposits of ashes approaching true culture layers, separated by a depth of two inches of brown earth and rock fragments; but these strata, if strata they are, were so broken by faults as to make authentic data of the kind impossible.

This small chamber, barely five feet square, yielded rich results, much richer, relatively, than the excavations in the Inscription Chamber.

We had the good fortune to encounter two small hollows in the bed-rock that evidently had once served as "caches." One of them held several of the handsomest obsidian knives that I have ever seen; while

the other held many chalcedony chips, evidently newly chipped and unused when buried. One of these obsidian knives was presented to Don Antonio Fajardo, for the owner of the lands embracing the Cave of Loltun, and the remainder are now among the specimens at the Museum. Two of these are illustrated on Plate VII. Fig. 2 a.



FIG. 13.—ORNAMENT
CARVED FROM SHELL. $\frac{1}{4}$.

Fragments of an elaborate incense burner, portions of which still hold the bright colors of red and white, are among the interesting objects exhumed; also, a very artistic ornament of pink shell, carved in the form of a flower (Fig. 12).

Chipped flint implements, fragmentary objects of burned clay, some still showing bright colors, ornaments carved from pearl and conch shells, clay pellets like the nineteenth-century boys' marbles (Plate VII. Fig. 1 b), bone awls and needles, beads and unworked pebbles of yellow stone, hammer stones, and broken spear-points are among the specimens brought

to light by the excavation of this shelf chamber. Many of these specimens are illustrated upon Plates VII. and VIII.

In the mingled ash and refuse material, filling a hollow in the rock floor six feet from the west wall and nine feet from the south, were found fragmentary portions of human bones, much decayed, and human teeth filed into curious forms.

Close by these bones were little heaps of hard clay pellets, resembling marbles, which probably were the pellets that once served as sounders in the hollow feet of tripod vessels, of which our excavations of last season gave the Museum several fine examples.

The floor of Chamber 3 was marked into sections for systematic working, as in the previous instance. The sections excavated were thus worked down to hard-pan, or rock bottom. In places this is a hard-packed, yellowish earth of an ochreous nature, totally unlike the red earth of the surrounding country. In others, it is a crystalline limestone. This hard-pan is also subject to great inequalities. In places it is barely three feet beneath the surface. In others, not many yards distant, it has several times that depth. It seems to consist of ancient channels, probably hollowed out by the action of running water when the cave was new, and of ridge-like protuberances, — gigantic stalagmites.

The average depth of excavation made this season was four feet, although many side and test excavations reached a much greater depth. These excavations were made and worked with great care, under the constant supervision of Mr. Saville or myself. The earth, before it was dislodged, was subjected to careful inspection *in situ*, and suitable observations were made and noted. The earth material was then taken in baskets and carried to a large sieve, where, as it passed slowly through the meshes, it received a searching investigation.

Many side and test excavations were made in order to study the extent and character of the deposits. These excavations were either narrow trenches or circular pits reaching down to the actual bed-rock, and in cases where the rock bottom gave an uncertain sound as if it might be a rock fallen in early times from the roof, and not the actual floor, long steel tapping chisels, nine feet long and a half-inch in diameter, were brought into use. They cut into the lime rock easily and quickly, and soon proved the truth of the matter. In one place we drilled seven feet into the floor, and as at that depth a light steel test-rod rang as clear as a bell, we knew there was at least two yards more of solid rock material, and we concluded to accept as a fact the idea that we had encountered the primitive floor of the cave.

After our work was finished, in deference to the expressed wish



FIG. 14. — CARVED
STONE PENDANT. $\frac{1}{4}$.

of the owner of the hacienda, the deeper and consequently dangerous, excavations were refilled.

As the result of our work upon this chamber floor, we obtained potsherds of various patterns (Plate VII. and VIII.), also obsidian points, clay beads, flint implements, flakes, jade beads, carved stone, clay and shell neck pendants, fragments of carved pearl and conch shells, together with human bones; among the interesting objects are several bone needles, beautifully formed and polished (Fig. 15), some of which are double pointed. These various objects were not found in any particular spot, but were scattered here and there, and encountered, as the work progressed, at an average depth of nineteen inches beneath the present surface. Flint flakes and potsherds were also found at a much greater depth.



FIG. 15. — BONE NEEDLES. $\frac{1}{4}$.

Three very distinct and general layers of ashes were at depths, respectively, of six inches, sixteen inches, and thirty-one inches. Below these layers of ashes others were found at varying depths. These were local in character, containing diminishing quantities of flint flakes and potsherds, the latter being either plain or of the reed-marked pattern. Several fragments of human skulls were found. Among the fragments were human teeth filed into curious shapes (Fig. 16). The pieces were scattered over an area several yards square, and do not seem to be fragments of one skull. This dispersion of fragments does not seem to be due to later disturbance of the layer in which they were found, but rather to have taken place at a time preceding the natural deposition of the matter immediately above them. Almost all the articles, with the exception of the potsherds and animal bones, are of a character that, while they might be lost, they would hardly be thrown aside as useless.



FIG. 16. — HUMAN TEETH, WITH FILED EDGES.

Flint is scarce in Yucatan, and obsidian is not found at all, and these fragments, serviceable, however small, would not be thrown away as refuse. Such articles, as well as the jade beads, pendants, and bone needles, were probably lost from time to time and buried in the general deposit.

An object of special interest is a fragment of a whistling vessel, like those of Peru and Costa Rica; several fragments of the hard, black, thin ware were found, but the fragment mentioned contains the whistle intact (Fig. 19). The only other specimen in any way similar, that I have seen in Yucatan, is now in the Museum at Merida, and of this

through the kindness of the Director, I have been able to send to the Museum a facsimile in plaster. The ware is not of the kind made either in the past or present of Yucatan, so far as our present knowledge extends, and it would appear that these vessels were ancient importations from a distant nation.

From time to time, as the work went on, explorations were made into the distant passages of the cave, and new wonders were constantly revealed to us.

Upon the walls of a tunnel-like passage with a general trend to the north-west, we found curious symbols outlined in black pigment, showing remarkably clear and distinct against the yellow-white surface of the stone wall.

One distant chamber, approached after many turns in the inky darkness of the tunnel, had death's heads carved upon the wall surface, and the many projecting knobs of stone were so carved that grinning skulls confronted one at every turn. Thorough search in this grewsome chamber failed to reveal graves or any evidence that it had ever served as a burial-place for the dead.

In another chamber the projections were fashioned in the shape of tigers' heads instead of death's heads.

As we followed the long, winding passage, a faint gleam of light became visible in the distance. Following up the clew, we found ourselves at the mouth of a long tunnel, or passage, at the very bottom of a great well-like cavity in the earth. The hot sun poured down into it, and great trees, laden with vegetable parasites, shot upwards into the sunlight of the upper world.

Upon the left of this great black opening from which we had just emerged, and stood blinking and winking in the sunlight, a portion of the rocky wall that loomed up sheer around us for forty feet or more had been partially smoothed and upon its surface had been carved in low relief the richly clad figure of a warrior or priest of heroic size (Plate VI.). This majestic figure, with flowing plumes, jewelled penache, and long lance in hand, had guarded this hidden passage for who knows how many years or centuries, and as we stood before him and studied the stern, grim outlines of the face, we felt like removing our hats in



FIG. 17. — ROCK PAINTING, CAVE OF LOLTUN. $\frac{1}{4}$.

From sketch by M. H. Saville.



FIG. 18. — ROCK PAINTING, CAVE OF LOLTUN. $\frac{1}{4}$.

From tracing by M. H. Saville.

his presence. After which, we gave him a good bath,—for the passing centuries had left him very dirty,—and then took his photograph and a mould of him in paper.

Entire seasons could be spent in this cave work, and not a day pass without the discovery of some important fact or interesting specimen.

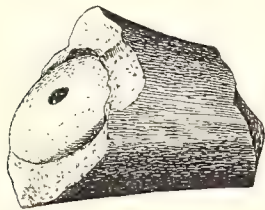


FIG. 19. — FRAGMENT OF WHISTLING VESSEL. $\frac{1}{4}$.

But we had accomplished the object of our researches in this, the typical cave of Yucatan. We had delved through the deposits of the present day, through the accumulations of unknown centuries, down to and into the crystalline surface of the ancient floor itself.

Our steel chisel points had probed into the ages when, in all probability, the Peninsula of Yucatan was newly risen from the depths and none save the strange creatures of the sea knew her secret chambers. This grotto, unlike those of Montmatre and Hohenfels, told no tales of the man beast. On the contrary, from the earliest period of its use as a human habitation, the people seem to have been of the same manners, religious customs, and household habits as those who built the great structures above them now in ruins.

It would be vastly interesting, no doubt, to be able to state that split human bones, charred by fire, were found, thus proving that cannibalism was indulged in, among other strange customs; but the sober



FIG. 20. — BEAD OF IRON PYRITES. $\frac{1}{4}$.

truth compels us to say, that while we found a number of human bones, some in fragments, others whole, none showed any trace of being charred by fire or any other evidence of cannibalism. And I have no hesitation in expressing my firm conviction, based not only on the evidence obtained by this investigation, but upon studies personally carried on in other

caves, that no people or race of so-called Cave People ever existed in Yucatan. And that, while these caves of the Loltun type were undoubtedly inhabited, it was by the same race and people that built the great stone structures now in ruins; and I furthermore believe that the caves were only temporary places of refuge, and not permanent habitations.

EXPLANATION OF PLATES.

PLATE I.

- FIG. 1. Principal Entrance to the Cave of Loltun.
FIG. 2. Stalactites in the Inscription Chamber (third Chamber).

PLATE II.

- FIG. 1. Inscription 1 in third Chamber.
FIG. 2. Inscription 6 in third Chamber.

PLATE III.

- FIG. 1. Inscription 2 in third Chamber.
FIG. 2. Inscription 7 in third Chamber.

PLATE IV.

- FIG. 1. Inscription 4 *a* in third Chamber.
FIG. 2. Inscription 4 *b* on same Rock as 4 *a*.

PLATE V.

Inscription 3 in third Chamber.

PLATE VI.

Bas-relief on Wall near one of the Entrances to the Cave.

PLATE VII.

FIG. 1. Terra-cotta Objects found in the Excavations made in the Cave.

- a.* Stamp, with short handle upon side not shown in illustration.
- b.* Balls, such as are frequently found within hollow legs of vessels.
- c.* Globular Beads.
- d.* Cylindrical Beads.
- e.* Ornamented Bead-like Object.
- f.* Potsherd Discs.
- g.* Potsherd Discs, perforated.
- h.* Legs of Vessels.
- i.* Potsherds with painted decorations.
- j.* Potsherds with incised decorations.

FIG. 2. Implements of Stone found in Excavations.

- a.* Obsidian Knives.
- b.* Rude Chipped Implement of Flint.
- c.* Flint Knives or Scrapers.
- d.* Flint Scraper.
- e.* Leaf-shaped Knife of Flint.
- f.* Leaf-shaped Knife of Flint, broken.
- g.* Flint Knife.
- h.* Flint Arrowheads.
- i.* Fragment of Stone Implement.
- j.* Perforated Stones.
- k.* Artificially shaped Stone Balls.
- l.* Muller or Grinding Stone.

PLATE VIII.

FIG. 1. Terra-cotta Objects found in the Excavations. These are probably fragments of ornamental figures, and many of them are decorated in unburnt colors, including white, black, red, brown, green, and yellow.

FIG. 2. Fragments of Vessels, including Handles and Portions of Rims.



FIG. 1.—PRINCIPAL ENTRANCE TO CAVE OF LOLTUN.

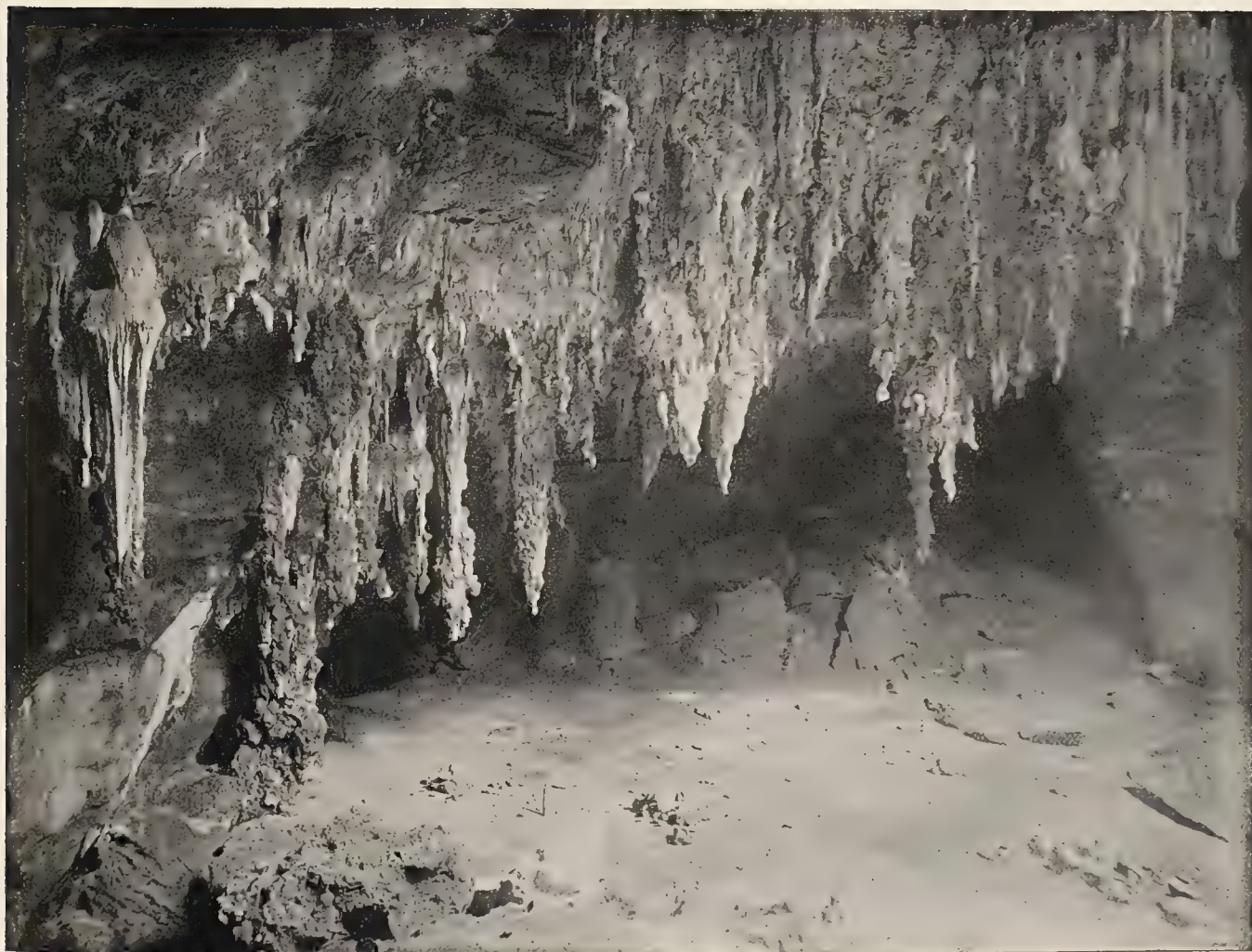


FIG. 2.—STALACTITES, INSCRIPTION CHAMBER (NO. 3), CAVE OF LOLTUN.



FIG. 1.—INSCRIPTION 1, CHAMBER 3, CAVE OF LOLTUN.



FIG. 2.—INSCRIPTION 6, CHAMBER 3, CAVE OF LOLTUN.



FIG. 1. — INSCRIPTION 2, CHAMBER 3, CAVE OF LOLTUN.

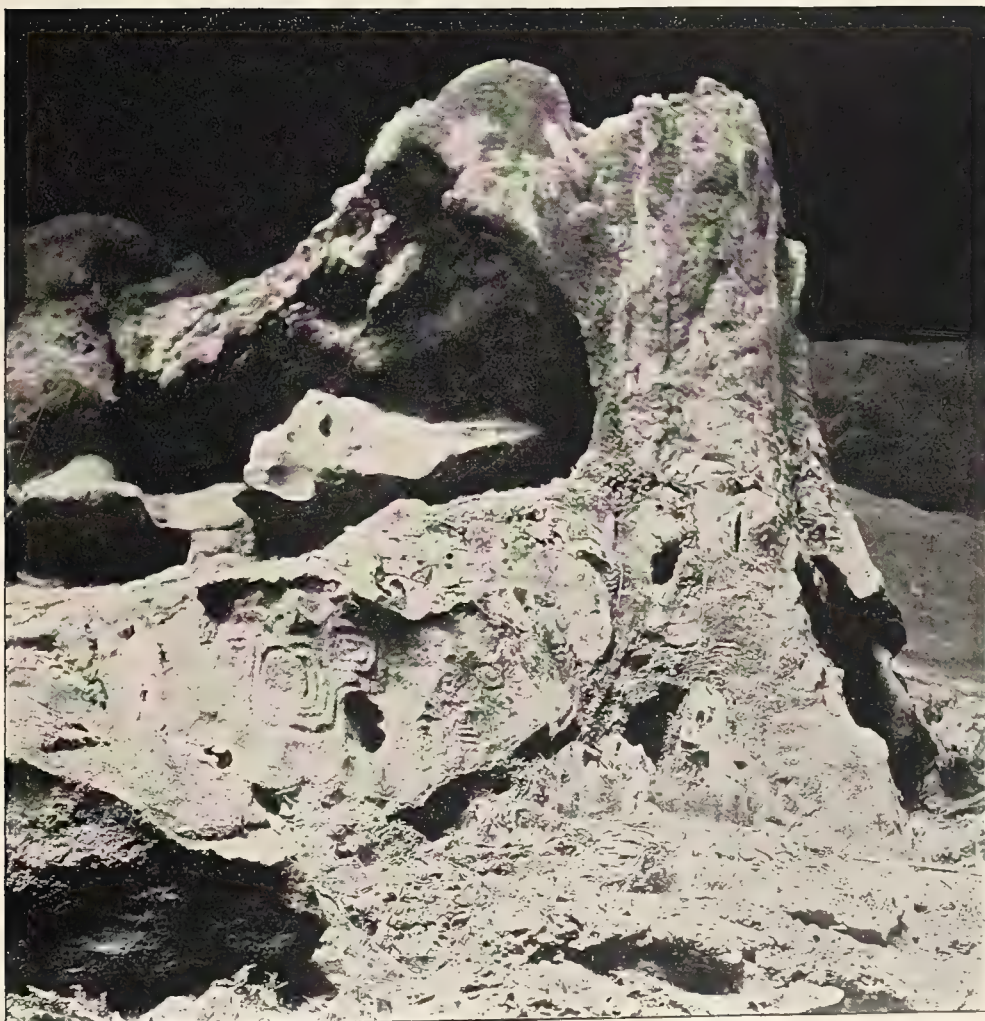


FIG. 2. — INSCRIPTION 7, CHAMBER 3, CAVE OF LOLTUN.



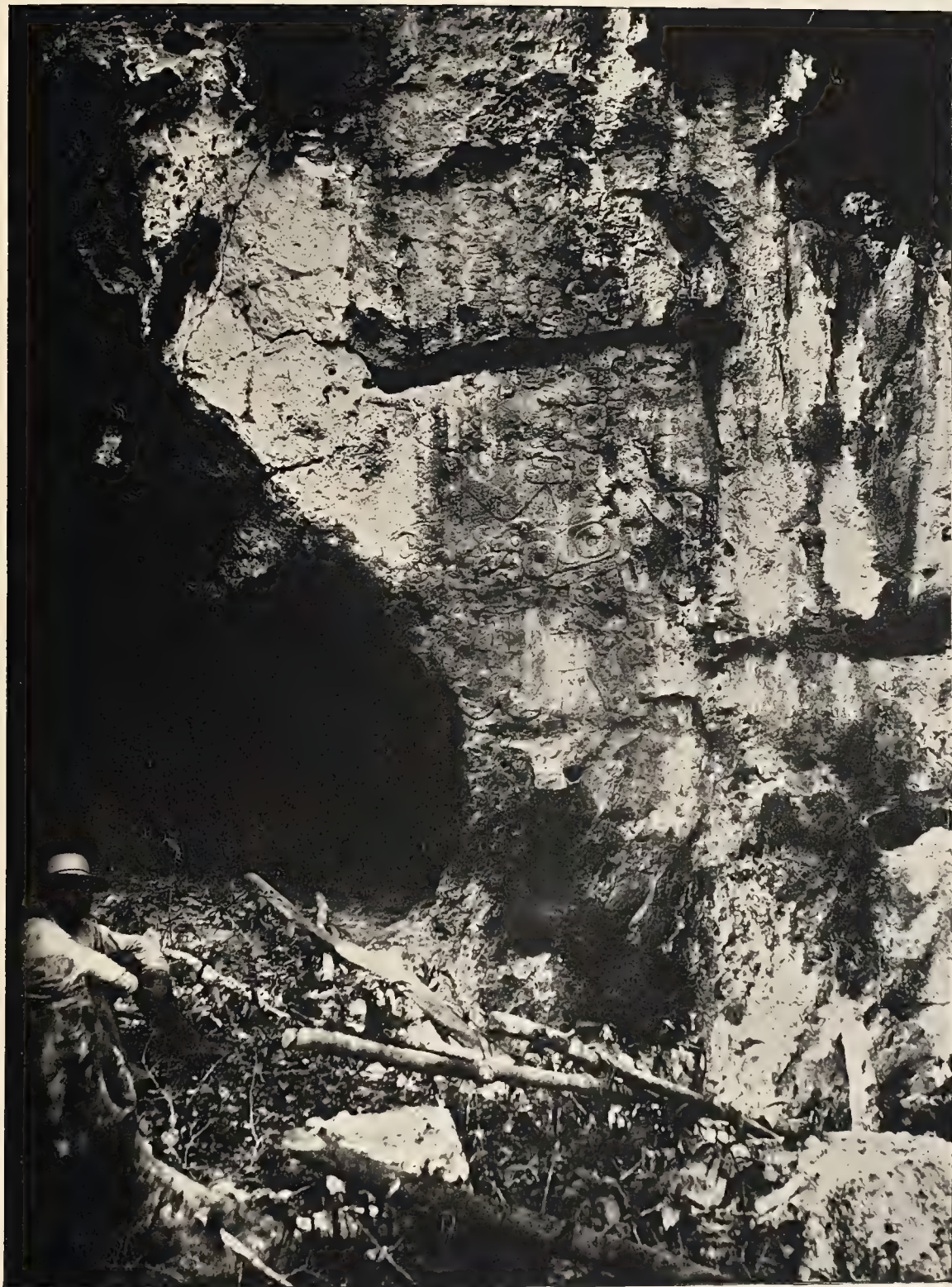
FIG. 1. — INSCRIPTION 4 a, CHAMBER 3, CAVE OF LOLTUN.



FIG. 2. — INSCRIPTION 4 b, CHAMBER 3, CAVE OF LOLTUN.



INSCRIPTION 3, CHAMBER 3, CAVE OF LOLTUN.



BAS-RELIEF UPON WALL NEAR ONE OF THE ENTRANCES, CAVE OF LOLTUN.



FIG. 1.—OBJECTS OF TERRA-COTTA, FROM EXCAVATIONS, CAVE OF LOLTUN.



FIG. 2.—IMPLEMENTS OF STONE, FROM EXCAVATIONS, CAVE OF LOLTUN.



FIG. 1.—OBJECTS OF TERRA-COTTA, FROM EXCAVATIONS, CAVE OF LOLTUN.



FIG. 2.—POTSHERDS, FROM EXCAVATIONS, CAVE OF LOLTUN.

MEMOIRS

OF THE

PEABODY MUSEUM OF AMERICAN ARCHAEOLOGY AND
ETHNOLOGY, HARVARD UNIVERSITY.

VOL. I.—No. 3.

THE CHULTUNES OF LABNÁ,
YUCATAN.

REPORT OF EXPLORATIONS BY THE MUSEUM, 1888-89 AND 1890-91.

BY

EDWARD H. THOMPSON.

CAMBRIDGE:

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EDITORIAL NOTE.

THE following paper on the Chultunes of Labná was received from Mr. Thompson as a part of his report on the explorations of the ruins of the prehistoric city of Labná.

In the second Memoir of this series a brief statement is made in relation to the Peabody Museum expeditions to Yucatan. Some of the interesting structures described by Mr. Thompson in the following pages were explored by the Museum expedition in 1888-89; others were examined during the second expedition in 1890-91; and further observations were made by Mr. Thompson during the year or two following.

Mr. Thompson's researches show that these subterranean structures vary in their character. Some of them, he thinks, were primarily excavations made for obtaining a peculiar earth, called by the natives "zahcab," which was extensively used as a stucco to cover the walls of the rooms in the stone buildings, as well as for sculpture and for moulding into various forms, as many specimens from Labná give evidence. These excavations were afterward used as cisterns for collecting and storing rain water,—a necessary provision in this limestone country where water is so difficult to obtain.

Stephens was probably the first author to call attention to these subterranean chambers, both at Uxmal and Labná. He was at a loss to explain their use, but was inclined to regard several of those he examined at Uxmal as cisterns. One which he examined at Labná is described as being unlike those at Uxmal and not likely to have been a cistern (*Travels in Yucatan*, Vol. II., pp. 55-59). In his account of the cisterns at Uxmal (*Travels in Yucatan*, Vol. I., pp. 226-234) he mentions one in which he found a mound of earth and débris, apparently similar to those in the Chultunes of Labná described by Mr. Thompson. In this cistern he found a number of potsherds and a tripod vase; but he did not remove the earth, and therefore we do not know whether or not it contained human bones, as Mr. Thompson found to be the case in many instances at Labná.

The finding of human bones and various objects in these subterranean chambers leads Mr. Thompson to believe that many of these singular structures were finally used as depositories for human remains, probably secondary burials in connection with some special rite, after which the opening to the Chultune was closed and cemented.

The use of these structures, so carefully made and so essential as reservoirs, as receptacles for human bones, and the fact that several have on the walls representations of birds, turtles, and other figures, indicate a singular and interesting feature in the customs of the unknown inhabitants of this ancient and ruined city. It is important to learn whether this custom prevailed in other prehistoric cities of Mexico and Central America.

The figures accompanying this report, showing the ground plans and vertical sections of a large number of these subterranean structures, together with the detailed accounts given on the following pages, represent the first systematic study of the Chultunes of Yucatan.

F. W. PUTNAM,

Curator of the Museum.

HARVARD UNIVERSITY, CAMBRIDGE,
SEPTEMBER 4, 1897.

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THE CHULTUNES OF LABNÁ.

THROUGHOUT many of the ruined groups of Yucatan there are subterranean structures of a peculiar class. These are generally single chambers of a vault-like appearance built from ten to fifteen feet beneath the surface and communicating with the outer world only by means of a narrow well-like opening placed near the apex of the vaulted roof.

These structures are sometimes well-built chambers, having their walls, roof, and floor of dressed stones, and finished with a coating of fine hard stucco. A typical example of this class is shown in Figs. 1 and 2, the original being the structure sunk into the second terrace of the "Palace," Ruined Group of Labná.

Others are of a much rougher class, and were formed in the cavities or pockets from which the white earth called by the natives "zahcab" had been taken.* These cavities, when their size and position were suitable, had their entrances closed up until only the circular opening was left. The roofs, walls, and floors were coated with thick layers of cement like stucco, which after being allowed to harden for a while was burnished into an impermeable surface by means of smooth stone implements, and the resultant structures so economically formed were ready for use.

I have called them all subterranean reservoirs, but opinions differ as to the use of these singular structures. Some students believe them to have

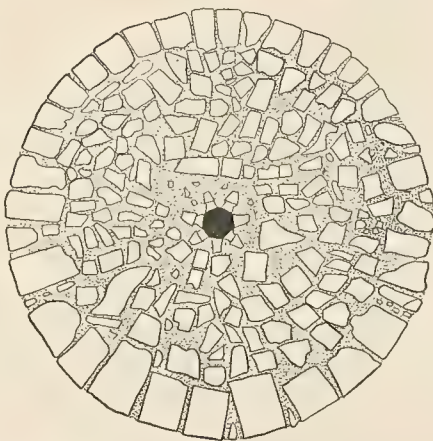


FIG. 1. — CIRCULAR PAVEMENT AROUND ENTRANCE TO CHULTUN, UPON SECOND TERRACE OF THE "PALACE," RUINED GROUP AT LABNÁ.

* Zahcab is very abundant throughout Yucatan. It is found in pockets of various sizes. It is a white earth of a peculiar character, and served the ancient builders, as it does those of the present day, as a building material to mix with lime in the place of silicious sand, which is practically unknown in Yucatan.

been storehouses for grain and other food. I believe them to have been, first and foremost, reservoirs to receive and hold rain water as it fell during the wet season, against the needs of the dry season. While some of them may well have served as depositories, this use was only incidental, and not the prime intention of their builders.

My reasons for this belief are as follows: The greater portion of the peninsula of Yucatan is one huge mass of limestone rock, — a recent formation, geologically speaking, — and save in some specially favored location this formation is near the surface, forming a level, monotonous region over which flow no rivers. No bubbling springs gush forth to create oases of refreshing

coolness for the insect-bitten traveller; and to many natives of the region open water is an unknown vision.

But two methods of water supply were available to the ancient builders. One was to seek for water in the depths of the earth, and the other to catch it as it fell from the clouds and store it for the time of need.

To seek for water by perforating through fifty or a hundred feet of solid rock, often flintlike in density, was evidently not to be thought of by them. I have never found a well that I am certain was dug by the builders of these ruined groups. To a certain degree nature helped the people out of this dilemma, and made it possible for them to obtain water. As is often the case in calcareous formations, many natural cavities exist in the rocky bowels of the peninsula. Some of these are open to the light of day, and extend down and into the water level by means of huge chambers or labyrinthian passages, ending suddenly upon the edges of pools of water as cool and clear as crystal, seeming, in the darkness of the gloomy space around them, to be pools of blackest ink.

These water caverns, called by the natives "ponot," now wrongly called by the modern natives "cenotes," or water caves, furnished an inexhaustible supply of the precious fluid, and were ever sought for and utilized. Large populations grew up around some of them. Chichen Itza, one of the largest groups of ancient ruins in the Americas, was built up around several of these great caverns. The name itself, "Chichen Itza," signifies in Maya,

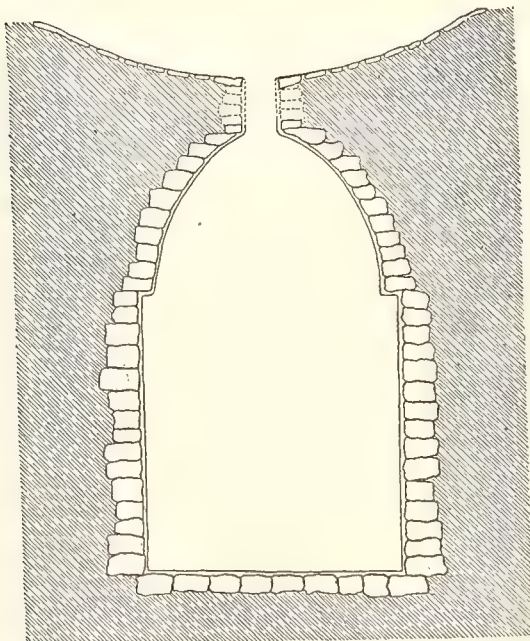


FIG. 2. — VERTICAL SECTION THROUGH CHULTUN, UPON SECOND TERRACE OF THE "PALACE," RUINED GROUP AT LABNÁ.

the mouth of the well of the Itzas: *chi*, mouth; *chen*, well; *Itza*, of the Itzas.

Steps cut into the solid rock, withe-bound ladders, and inclined planes, to-day as formerly, furnish the means of access to the coveted water. In some places the modes of approach are so difficult and dangerous that the general custom of the country has to be reversed, and the men, instead of the women, have to bring the water to the surface.

The groups of structures built far from the cenotes were of course debarred from this source of supply, and the natives were compelled to adopt the second method, that of collection and storage. Nature relented a little in their behalf also, and furnished them with "haltunes," which, translated into our language, means potholes in the impervious rock, that during the wet season became filled with water.

These potholes were numerous, and some were of great size. I found one in the jungle near the ruined group of Chuntichmool capable of holding several thousand gallons. Steps had been cut by the prehistoric water-carriers down the solid rock side and into the cavity, and as the water gradually lowered, by these steps they could follow it to the last drop. I found it nearly filled with the accumulated mould of centuries, but the water was still clear and potable.

But these natural reservoirs were in the very nature of things exposed and precarious. What more natural than that the people should seek to eke out the supply by storage in artificial reservoirs?

They did this in places by improving natural drainage and enlarging natural basins. They also made basins, some of them of large size. The ruined groups of Uxmal and Xkichnook furnish notable examples of this. The "akalches" that make Uxmal to-day a hot-bed of deadly fevers, are the supply basins of the ancient times; their once clear bottoms are now buried deep in swamp ooze, and decaying vegetation masks their true outline. Wild ducks, serpents, and great frogs are now the only creatures that can live beneath the great white sheet of miasma that each night shrouds the deserted yet magnificent piles near by.

In other places the people seem to have depended upon a large number of smaller reservoirs, — the subterranean chambers here described. Each edifice, each terrace, even of the same structure, had one and often more of these subterranean chambers. No one of them could hold a great quantity of water. The largest one I ever encountered held less than ten thousand gallons. Yet when these are counted by the score, as is the case in many of these groups, the aggregate amount of water supply will be found to be amply sufficient for the needs of a large number of persons, especially if the fact be taken into consideration that these people seem to have had practically no domestic animals and were, if they in any way resemble their descendants of to-day, remarkably abstemious in the quantity of water they

drank. A white man will drink more water in one day than his native guide will in three days, and the native will be carrying a heavy burden while the white man is riding comfortably in saddle or volan.

We also note the significant fact that where the groups are built by the side of cenotes few, if any, of these subterranean chambers are found, while they are found by the score in groups not so favored by nature. The now ruined group of Labná is an example of this latter class. Built far away from any cenote, — the nearest one so far as known being the famous Loltun,* Cave of the Stone flowers, nearly twelve miles distant, — the inhabitants had to depend entirely upon the rainfall for their supply, so far as we now know.

Every one of the numerous hills that surround the group had its crown levelled and its steep sides cut into terraces, and every terrace examined shows traces of having had one, and sometimes two, of these reservoirs.

A wide area around the principal structures now standing is covered with mounds and terraces, and interspersed among these are subterranean reservoirs, one at least for every mound or terrace. Many are now difficult to find; some are hidden beneath the débris of the buildings that now form the mounds; others are almost obliterated by the caving in of their walls and the washings of centuries. Several are yet in shape for study, and one, which is represented by Figs. 1 and 2 from photographs and drawings made during the expedition of 1889, is so nearly intact that it could easily be restored to usefulness. Some were concealed. Their mouths were sealed by a heavy stone slab and cemented with thick stucco.

It seemed desirable that these curious structures should be investigated, and that their contents, whether detritus or material intentionally placed by man, should be preserved and studied.

This was neither an easy nor a safe undertaking. In fact, one of the narrowest escapes of my life came to me in the semi-darkness of one of these underground vaults. As one is being lowered by a rope down through the narrow well-like opening into the darkness beneath, there is always the charming uncertainty as to whether a viper's head will be thrust into one's face on the way down; whether the whirl of a rattlesnake's rattle or the skurry of a nest of tarantulas or scorpions will be the first greeting on touching the chamber floor. The work was done, however, and fully sixty of these structures were subjected to investigation. Thirty-three of these yielded successful results, and the remainder were found to be either in a state of formation or else so entirely destroyed that even their original outline could not be traced.

Our method of working was as follows: First, carefully opening a sealed chultun, a lighted candle was lowered into the darkness beneath as a test for mephitic gas. A bunch of inflammable grass would have served

* See Report on Cave of Loltun, Memoirs of the Peabody Museum, No. 2.

better, but as the charred grass would be scattered among the material accumulated upon the chamber floor and might thus cause doubt as to the authenticity of any charred material found actually in place, I deemed it best to allow no chance for doubt, and so used only sperm candles, the droppings of which could not be confounded with any other substance. A large bellows and a long flexible rubber tube formed a very effective means of replacing the mephitic layer with good, fresh, even if dusty, air. This enabled us to work with some degree of composure, although no amount of care could make the work in the close vault anything but intensely disagreeable. The least movement, the mere action of the expressed air from the tube, raised clouds of impalpable dust atoms, the accumulation of centuries. Alternate outside and inside work was the only available method by which the work could be carried on. Commencing at the extreme outer edge of the deposit upon the floor of the chamber, the excavation was carried on in diagrammed, vertical sections, each section being excavated by candle light with hand-brush and small trowel. The refuse material was then hoisted out of the chamber into the light of day, where it was passed through a large, finely-meshed sieve, and carefully scrutinized for specimens.

CHULTUN No. 1 (Plate I. Fig. 1), situated near the northeast corner of Mound 8, was the first chamber to be excavated. This chamber was closed by a large square stone placed over the mouth and firmly cemented into position by the usual cement of the ancients, — a mixture of one part slaked lime to two parts zahcab. This had then been covered over by loose rubble, over which had grown the jungle and large trees. It seems to have been originally one of the zahcab pockets before described. It is irregular in shape, fifteen feet in diameter at the base, and twelve in height to the circular opening, which is one foot six inches in diameter, with a height of three feet six inches, measuring from the termination of the orifice in the apex of the chamber roof to the surface of the terrace.

The accumulation of material on the floor was three feet deep directly under the orifice, and two feet deep near the chamber walls. This low mound-shaped accumulation was covered three inches deep with fine white dust, — the depositions and borings of myriad insect larvæ in the roof and walls of the chamber. The accumulation upon the reservoir bottom bore no evidence of stratification or gradual deposition save only in the upper six inches, which was a mixture of fine plaster particles, insect and reptile casts, mouse and iguana bones, snail shells, beetle wings, and spider cells. Directly upon the bottom of the reservoir was a large stone collar, similar to the one illustrated on Plate IX. Fig. 2. It was circular in shape and very smoothly finished. This collar had evidently been purposely broken, torn from its place, probably at the mouth of the chultun, and thrown in upon the reservoir floor. Close by it was found a circular stone, a disk that when placed over the restored collar just covered the central orifice. Thus

we get a presumably correct idea of the methods the ancients used to prevent contamination of the stored water.

Mixed ashes and earth covered the floor to a depth of an inch, and in places nearly an inch and a half. In this deposit were found potsherds of various forms and patterns, a crystal bead (Plate X. Fig. 25), a bead of lime

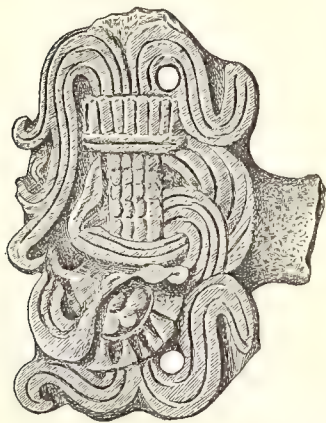


FIG. 3.—DOUBLE WHISTLE
OF TERRA-COTTA, CHULTUN
1. $\frac{1}{4}$.

cement (Plate X. Fig. 36), and a fragment of an obsidian knife. In the earth immediately above this ash mixture were found potsherds, bones of animals and animal teeth, human heads in terra-cotta, and a human tooth. Fragments of human bones were also found, but very much decayed. In the next two feet of material were found an animal's head of terra-cotta (Plate XI. Fig. 15), a double whistle of terra-cotta (Fig. 3), and a portion of a cutting implement of bone. Among the most interesting of the specimens found was the mouthpiece and upper portion of a whistle of terra-cotta ornamented with a human head bearing an elaborate head-dress (Plate XII. Fig. 21).

CHULTUN No. 2 (Plate I. Fig. 2), situated at the southern intersection of Mounds 3 and 4, was carefully sealed in the same manner as No. 1. The mound-shaped accumulation was of the same general character as previously described. The first foot of material seemed to have been carefully placed, and the rest thrown in carelessly. In the first foot above the actual floor were found potsherds, sea-shell pendants, beads of shell and lime cement, and human teeth and bones much decayed. In the remaining superimposed deposit were found potsherds, terra-cotta heads, human and animal, fragments of knives of obsidian and flint, a smooth ball of stone, bone beads,



FIG. 4.—EN-
GRAVED SHELL
DISK, CHULTUN
2. $\frac{1}{4}$.

a pin or lip-plug of shell, the engraved shell disk shown in Fig. 4, and fragments of terra-cotta musical instruments. A whistle modelled in the form of a monkey (Plate XIII. Fig. 1, *a*), a finely polished washer-shaped object made from iron pyrites, the upper portion of a large whistle ornamented with a human head (Plate XII. Fig. 19), and the terra-cotta heads illustrated on Plate XI. Fig. 17, and Plate XII. Figs. 1, 2, and 8, were also taken from this reservoir.

On the northern wall the figure of a duck in high relief was moulded in the plastic stucco (Plate I. Fig. 2). On the walls of chultunes numbered 5, 9, 15, 27 are other similar figures of various animals.

CHULTUN No. 3 (Plate I. Fig. 3) is situated fifty feet south of the one just described. This was also sealed, but less carefully. The stone had become

loosened by falling material and large roots had grown up within. There was the usual mound-shaped deposit about four feet high. The specimens found are as follows: A few potsherds, many fragments of objects in terra-cotta, including whistles (one of which is illustrated on Plate XIII. Fig. 1, *f*), cylindrical pieces with perforation through one end, a fragment of a circular stamp, several small terra-cotta balls, finely formed terra-cotta beads painted black, beads of shell (including those shown on Plate X. Figs. 9 and 11), beads of lime cement (Plate X. Figs. 30, 37, 46), stucco ornaments (Plate X. Figs. 48-50), and a portion of an engraved bone ring. Several heads in terra-cotta were found, three of which had been used as the upper portions of musical instruments (Plate XII. Figs. 17, 18, 20). Two other heads are illustrated (Plate XII. Fig. 9, and Plate XI. Fig. 19), a double whistle representing two monkeys (Plate XIII. Fig. 1, *b*), a number of shells of *Oliva* with the apex of each ground away for the passage of a cord, worked shells of several species, obsidian knives, a thick leaf-shaped implement of chalcedony (Fig. 5), and a broken instrument used in preparing agave fibre (similar to the one represented in Fig. 7).



FIG. 5. — CHIPPED IMPLEMENT OF CHALCEDONY. CHULTUN 3. $\frac{1}{2}$.

Three small clay vessels (Plate XIII. Fig. 2, *a*, *b*, *c*) were also found, — one at one foot six inches in the deposit above the floor, and the other two six inches higher up in the mass. They were perfect except that the largest one had its bottom perforated, as is often the case with vessels found in the ancient graves of Yucatan. The position in which they were found leads to the belief that they were once placed upright in the reservoir, and that the succeeding down rush of material, as it was thrown in, pushed them onto their sides. Below and around them were found the above-mentioned specimens, which were not arranged in any order, but seemed to have been thrown in at the same time as was the earth material. The soft character of this earth, a dark red loam, prevented the destruction of all, except the most delicate objects, and formed a yielding cushion around the small clay vessels.



FIG. 6. — FLINT KNIFE FROM CHULTUN 4. $\frac{1}{2}$.

CHULTUN No. 4 (Plate I. Fig. 4) is situated two hundred and ninety feet southwest of "Old Edifice Group." The deposit was of the usual form and dimensions. The excavation yielded potsherds, an ornament of shell (Plate X. Fig. 17), human teeth, and the inner por-

tion of a large univalve shell. These were found within two feet of the bottom. A perfect flint knife (Fig. 6) was in the material of the deposit above the first two feet. The first two feet of earth in this reservoir seems to have been carefully placed. It was mixed to some extent with ashes and charred cedar-wood.

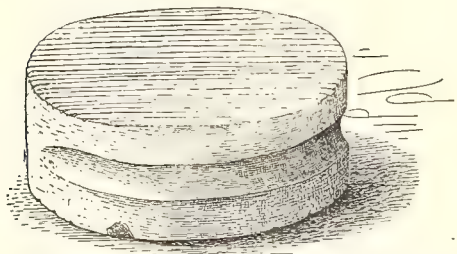


FIG. 7. — IMPLEMENT OF LIMESTONE USED IN THE PREPARATION OF AGAVE FIBRE. CHULTUN 6. $\frac{1}{2}$.

No traces of calcined bones were observed. The ashes and charred material found seemed to be entirely of wood.

CHULTUN No. 5 (Plate II. Fig. 5), situated seventy-five feet south of No. 4. The orifice, nearly six feet in diameter, was roughly formed of unhewn field stones. It was uncovered, and a large alamo tree had grown up in its cavity, the roots nearly concealing the opening from view.

This reservoir was nearly filled with the zahcab of the falling roof and walls, the usual insect sapping and mining being aided in this instance by the powerful wedging and leverage of the great alamo roots. The cleaning out of the obviously natural debris left two feet of earth material, evidently artificially deposited. In this deposit were found many potsherds, a part of a terra-cotta whistle, two terra-cotta heads once forming portions of musical instruments (one of which is illustrated on Plate XII. Fig. 16), a bead of shell (Plate X. Fig. 10), one of lime cement painted green in imitation of jadeite, and fragments of flint and obsidian implements; also portions of the cellular part of bones, probably human.

Upon the southeast wall of this reservoir, at a height of three feet above the floor, is the figure of a long-necked bird done in stucco. A similar figure was found carved in stone by the expedition of 1889.



FIG. 8. — CHIPPED IMPLEMENT OF FLINT WITH POLISHED CUTTING EDGE. CHULTUN 6. $\frac{1}{2}$.

CHULTUN No. 6 (Plate II. Fig. 6) is situated one hundred and twenty-five feet south of No. 5. This reservoir had once been sealed, but the stone had become partially displaced, probably by the entering roots of some long-rotted tree. A confused mass of material was exposed to view, — entwined rootlets, cast-off skins of serpents, bones, excrement and teeth of bats, iguana bones, a thick covering of ancient mould, and over all the thick yellow colored webs of great spiders. Amid the earth on the bottom of the reservoir were found the usual potsherds, a portion of a flint knife, a well preserved

grooved implement of limestone used in the preparation of agave fibre (Fig. 7), and a chipped implement of flint with ground cutting edge (Fig. 8). Various fragments of "katunes," or the roller of the maize grinding stone, were also found.

CHULTUN No. 7 (Plate II. Fig. 7) is situated eighty feet northwest of "Old Edifice." It contained the usual mound-shaped deposit. Directly upon the thin layer of ashes on the floor of the reservoir were found potsherds, a fragment of obsidian knife, a shell bead, a square ornament of shell with five perforations (Plate X. Fig. 15), and beads of lime cement.

In the earth material two feet or less above this ash deposit were encountered potsherds, fragments of bone, a long narrow flint implement (Fig. 9), and the mouth-piece of a terra-cotta whistle.

CHULTUN No. 8 (Plate II. Fig. 8) is situated two hundred and forty feet southeast of No. 3. It was well sealed, and in perfect state. The mound-shaped deposit was three feet high. The general conditions were similar to the other sealed reservoirs. The excavation yielded potsherds of various sizes and patterns, fragments of terra-cotta musical instruments, two shell ornaments (Plate X. Figs. 14 and 23), and two moulds of terra-cotta, about two inches long (Plate XI. Figs. 2 and 4). These moulds are most interesting, since they show the exact method by which the terra-cotta heads and masks were made (Figs. 1 and 3 on Plate XI. are casts from these moulds). This is, so far as I can ascertain, the first known instance of these moulds being found in Yucatan. It is by no means common to find a single terra-cotta head. Those that have been found are treasured in museums and private collections. We have during these expeditions not only made a large collection of these heads, but have also obtained the moulds in which similar heads were made.

Besides these specimens there are two others of a very interesting character, a stone head (Plate IX. Fig. 1) which was lying upon the reservoir floor, and a small jar (Plate XIII. Fig. 2, *d*) from the deposit about two feet above the floor.



FIG. 9. — FLINT KNIFE, CHULTUN 7. $\frac{1}{2}$.

CHULTUN No. 9 (Plate III. Fig. 9) is situated two hundred and ninety feet east of the northeast corner of the "Palace." The mound-shaped deposit is three feet high in the centre, and two feet six inches at the reservoir walls. The excavation yielded the usual potsherds, fragments of human bones, and human teeth, an obsidian knife, a worked crystal of calcite (Plate X. Fig. 28), a jadeite bead (Plate X. Fig. 26), and several beads of lime cement painted green in imitation of jadeite. The smaller cement beads are solid, but the larger specimens are hollow, and were probably made in this way to render them as light as possible (several of these beads are shown in Plate X. Figs. 29, 33, 34, 35, 38, 39, 40, 42, 43).

A well executed, mask-like head in terra-cotta (Plate XII. Fig. 15), painted black, was taken from this reservoir. The head is hollow, with an opening at the back and at the mouth and eyes. The upper portion of its

duplicate, evidently made in the same mould, was also recovered, together with several fragments of terra-cotta objects, including whistles.

Upon the walls of this reservoir there are two effigies in high relief, a long-necked bird, and a turtle.

CHULTUN No. 10 (Plate III. Fig. 10) was sealed in perfect shape. It yielded no specimens beyond a few potsherds. It was the only reservoir, sealed or otherwise, that we had found so barren of specimens. The usual mound-shaped deposit was also missing; the earth was nearly level all over the reservoir floor. Yet it may have contained originally the most precious treasures, for in the northeast corner I found a heap of brown, dust-like atoms rather regular in shape, four inches deep, nine long, and eight wide. The termites had eaten it and digested it; the crickets and borers had made it their home for many thousand generations of cricket life; it had been a mass of impalpable tobacco-colored powder for ages perhaps, before time had compressed it into a semi-coherent mass. Fancy consequently could have wide range without fear of contradiction and without hope of proof. Yet I could not help feeling that that brown rectangular heap of snuff-like dust once was what to us would now be a priceless treasure. With a sigh I put away the thought and turned to absolute facts once more.

CHULTUN No. 11 (Plate III. Fig. 11) is situated one hundred and forty feet north of the northwest corner of the "Old Edifice." It was uncovered and filled with rubbish and general débris of all kinds. The bones of a young deer and the skeleton of a wild pig, a javali, were found in the upper layer of débris. In the earth at the bottom of this reservoir were found a few potsherds, a small stone ball, and a piece of worked sea-shell. The appearance of the lowest earth deposit indicated that it was deposited under water, a well-defined layer of regular mud sediment four inches in depth. After this stratum had occurred, the lime material, caused by the boring insects, mixed with vegetable débris, bat and mice bones, and snail shells from above, settled down upon the mud sediment, by that time almost stone-like in its hardness. Thus the accumulation gradually grew; and I find no trace of man's hand in aiding the natural accumulation. The stone ball, the potsherds, and the sea-shell were deposited, probably carelessly dropped in, while the reservoir still held water, or else while the mud was still soft.

CHULTUN No. 12 (Plate III. Fig. 12) is situated seventy feet west of No. 11, upon the same ruined terrace. This reservoir is almost exactly described by the account given of the preceding reservoir. Several bone fragments were found, so decayed as to make identification impossible, and also a few beads of lime cement (one of which is shown in Plate X. Fig. 41). Close by the floor of the reservoir was found a stone collar, of the class previously described, broken into three pieces.

CHULTUN No. 13 (Plate IV. Fig. 13) is situated three hundred and fifty feet southeast of No. 3. This reservoir had been carefully closed in the

usual manner, but the entire north wall had caved in, covering the earth deposit with a layer of stone and lime over a yard thick. Removing this, we found a thin earth deposit only nine inches deep. From this we excavated a stone collar entire (Plate IX. Fig. 2), a small pitcher-like vessel almost intact (Plate XIII. Fig. 2, *e*), and some human bones very much decayed.

CHULTUN No. 14 (Plate IV. Fig. 14) is situated two hundred and sixty feet east of the "Palace." It was uncovered and half filled with *débris*. Excavations yielded potsherds and the terra-cotta heads shown upon Plate XI. Figs. 13, 18, 21, and 22, and Plate XII. Fig. 11.

CHULTUN No. 15 (Plate IV. Fig. 15) is situated one hundred and seventy feet north of No. 12. It was sealed completely. It contained the usual mound deposit. There was no evidence of any special care in depositing the first two feet of material. The excavation yielded potsherds, bones of animals, and a bead of lime cement.

Upon the walls of this reservoir are four figures in *mezzo-relievo*, — a snake, a turtle, a toad, and a nondescript creature.

CHULTUN No. 16 (Plate V. Fig. 16) is situated two hundred and eighty-four feet southwest of No. 13. It was uncovered and contained much *débris*. The excavation yielded only a few potsherds of the common classes and patterns.

CHULTUN No. 17 (Plate V. Fig. 17) is situated three hundred and twenty feet southwest of No. 16. The excavation yielded potsherds and a broken stone collar; also a portion of the skeleton of a native dog, including the skull.

CHULTUN No. 18 (Plate V. Fig. 18) is situated two hundred and twenty feet northwest of No. 14. It had been sealed, but the rock slab covering the opening had been cracked and forced apart by tree roots. The interior of the reservoir was a mass of roots. There was the usual mound-shaped deposit. The excavation yielded a broken stone collar, potsherds, fragments of human and animal bones, fragments of terra-cotta figures (one of which is illustrated upon Plate XII. Fig. 3), and a portion of a small jar similar to those already described. This jar was found lying on its side in the deposit, nine inches above the floor. An interesting specimen found in this reservoir was a large potsherd having the phallic emblem moulded upon it in low relief.

CHULTUN No. 19 (Plate V. Fig. 19) is situated two hundred and six feet northwest of No. 9. It was once sealed, but the cover is now entirely destroyed. The excavation yielded potsherds, several terra-cotta heads (Plate XII. 5, 6, 7, 10, 12, 13, 14), a shell pendant, fragments of obsidian knives, fragments of terra-cotta figures, and the portions of musical instruments illustrated on Plate XIII. Fig. 1, *e* and *i*. Fragments of bones were also found, but the dampness and other causes had left but little of them. This reservoir was built upon a low terrace densely overgrown with trees.

CHULTUN No. 20 is situated three hundred and twenty feet southwest of the "Palace." It contained potsherds, fragments of animal bones, fragment of a bird-shaped terra-cotta whistle, beads of terra-cotta and white stone, and three terra-cotta heads.

CHULTUNES Nos. 21 & 22 (Plate VI. Figs. 21, 22) are situated three hundred and thirty feet southwest of No. 3. These two reservoirs are united. Evidently two pockets of zahcab had been worked until one broke into the other. When the zahcab was exhausted the two pockets were converted into reservoirs, each having its separate mouth, but with an open way connecting the two beneath the surface. This is the first instance of this class of reservoir encountered by me. No. 21 contained the usual mound-shaped deposit. The first three feet of this deposit, from the floor up, was clearly placed in position and apparently stamped or hand-pressed. Upon the floor of the reservoir, with only a few inches of earth beneath them, were found two human skeletons smashed to fragments and decayed into mere lime dust, but clearly discernible as skeletons. Skeleton No. 1 was placed with the head toward the northeast, lying on its side with knees drawn up toward the chin, and facing the north. Skeleton No. 2 was placed directly north, in the same general posture. With these skeletons were found several small potsherds. Nearly a day was spent on each skeleton, with soft hand-brushes, forceps, and white glue atomizer, but the only portions of the skeletons that could be preserved were the enamel of the teeth and a few of the hardest joints of the bones.

CHULTUN No. 22 contained only a few common potsherds.

CHULTUN No. 23 is situated in the northeast corner of the Lower Rear Terrace of the Palace. Possibly this was once sealed, but it is now so destroyed that no actual proof exists. The excavation yielded potsherds, animal bones, — rabbit and javali, — beads of shell and lime cement, and a small highly polished disk of iron pyrites.

CHULTUN No. 24 (Plate VI. Fig. 24) is situated two hundred and twenty feet northwest of No. 9. This reservoir had been left unfinished; one side was not "evened off," and the stucco finish had not been applied. It contained only the tailings of the zahcab, the small stones that are always, even in the present day, left by the zahcab workers, and the surface material washed and blown in through the opening. Nine inches was the average thickness of the layer of this surface mould. Thorough investigation of the tailing did not yield a single specimen.

CHULTUN No. 25 (Plate VI. Fig. 25) is situated three hundred and twenty feet south of the "Palace." It was completely sealed in the usual manner. Seven small openings showed the burrows of moles and insects. It contained the usual mound-shaped deposit, consisting of earth mixed with bits of charcoal and ashes. The excavation yielded fragments of terra-cotta objects, including the well-modelled heads of quadrupeds (shown

on Plate XI. Figs. 12 and 20), animal bones, obsidian knives, worked sea-shells (including the pendant illustrated on Plate X. Fig. 18), two pieces of flint lance heads or knives, and a small terra-cotta vessel (Plate XIII. Fig. 2, *f*). The cylindrical stone of an ancient corn-mill was also taken from this reservoir.

CHULTUN No. 26 (Plate VII. Fig. 26) is situated one hundred and eighty feet northwest of No. 23. It was completely sealed, and filled almost to the neck with earth material placed by human hands in its position. Allowing for settling, etc., it must have been completely filled when closed.

The lowest layer, a yard thick, contained fragments of human bones and human teeth, teeth of the dog, a chalcedony knife (Fig. 10), also the lower half of a similar knife of flint.

The second layer of three feet, immediately above the preceding layer, contained innumerable potsherds, a terra-cotta whistle (Plate XIII. Fig. 1, *g*), a beetle of terra-cotta (Plate XI. Fig. 11), beads and ornaments of shell (Plate X. Figs. 1, 6, 12, 13), a bead of stone (Plate X. Fig. 24), beads of lime cement, and worked shell. This deposit was covered with a layer of lime and zahcab, borings of larvæ, and scalings from walls and roof.

CHULTUN No. 27 (Plate VII. Fig. 27) is situated in the north central portion of the rear high terrace of the "Palace." Huge stones, rectangular blocks, covered the mouth of this reservoir, but it is impossible to say whether it had been originally closed or not, as these stone masses had crushed the mouth out of all shape.

Very little material was upon the floor of this reservoir, less than two feet of earth material on a level. The excavation yielded small terra-cotta balls, and fragments of terra-cotta objects, including one of a human head and fragments of a mould shown on Plate XI. Figs. 8 and 9 (clay casts from these fragments are represented by Figs. 7 and 10 of this plate), bones of small animals, a portion of a flint knife, fragments of obsidian knives, a lime cement bead, painted green in imitation of jadeite, a stucco ornament similar to those illustrated on Plate X., a shell disk (Plate X. Fig. 19), a ball wrought from a calcite crystal, and a highly polished cylinder of the same material (Plate X. Fig. 27). Upon the eastern wall, at a height of three feet, we found the figure of a turtle on the stucco finish.

CHULTUN No. 28 (Plate VII. Fig. 28) is situated two hundred and



FIG. 10. — KNIFE
OF CHALCEDONY.
CHULTUN 26. $\frac{1}{2}$.



FIG. 11. — IMPLE-
MENT OF FLINT.
CHULTUN 28. $\frac{1}{2}$.

forty feet west of the extreme right wing of the "Palace." It was uncovered, and filled to a depth of five feet with general débris. There was no evidence that man had placed the earth material within. The excavations yielded a great quantity of potsherds, a perfect obsidian knife, and two fragments, and the rude flint implements illustrated in Figs. 11 and 12.

CHULTUN No. 29 (Plate VII. Fig. 29) is situated one hundred and ten feet southwest of No. 28. It is a double-mouthed reservoir and is much destroyed. We commenced work under the belief that it had once been a closed reservoir, but subsequent investigation proved the stone covering of the mouths to be fallen building material. No specimens except ordinary potsherds were found in this reservoir.

CHULTUN No. 30 (Plate VIII. Fig. 30) is situated three hundred and ten feet northeast of No. 29. It contained the usual mound-shaped deposit. A large stone, that probably had once covered the mouth, had been moved to one side, evidently at a much more recent period. The earth deposit within did not seem to have been disturbed, as it retained its regular sequence of dark red earth capped by the zahcab castings.

The excavation yielded potsherds and terra-cotta fragments only. The earth was damp and mouldy, and any bones would probably have long since decayed.

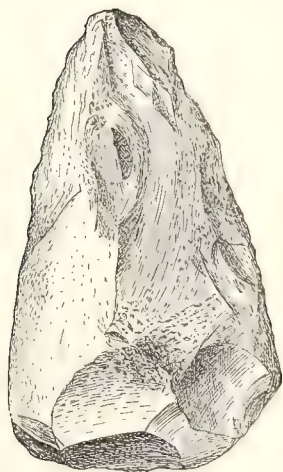


FIG. 12. — IMPLEMENT OF FLINT. CHULTUN 28. $\frac{1}{2}$.

CHULTUN No. 31 (Plate VIII. Fig. 31) is situated two hundred and twenty feet northwest of No. 30. It was well closed by a large stone and hard stucco. The deposit on the floor level was not mound-shaped. A thick layer of zahcab three feet deep, artificially placed, covered a mixture of earth and ashes nine inches deep, placed directly upon the reservoir bottom. In this lower layer we found fragments of terra-cotta objects, a bead of lime cement and one of shell, worked shell and two shell pendants (one of the pendants is illustrated on Plate X. Fig. 20), a terra-cotta mould for casting the head of a monkey (Plate XI. Figs. 5 and 6. Mould and clay cast), and a small terra-cotta vessel (Plate XIII. Fig. 2, *g*), which may have been an incense burner, having the top closed with the exception of an orifice three-eighths of an inch in diameter. This interesting specimen, however, resembles one form of ancient Greek temple lamp far more than it does an incense burner. On one side of the flat top can still be seen the dark spot where the burning wick was placed. The terra-cotta mould is in perfect shape, and shows the method of casting the terra-cotta heads of which we secured so fine a collection.

CHULTUN No. 32 (Plate VIII. Fig. 32) is situated one hundred and forty feet northeast of No. 12. This had once been sealed, but the stucco had been gradually worn away by gullies during the rainy seasons. The earth material within was damp and mouldy. The excavation yielded a few potsherds and bones of small animals. The steel sounding rod revealed the fact that this reservoir had a second bottom four feet beneath the first. This filling was composed of red earth and zahcab, mixed with field stones and stone chips. The excavation yielded two stone heads of rude workmanship.

CHULTUN No. 33 (Plate VIII. Fig. 33) is situated two hundred feet northeast of Mound 41. It was sealed, and the stone cover was in position. Less than a foot of earth deposit was upon the floor. This deposit had been placed and levelled by man. It contained a stone grinding mill or metate (Fig. 13), and a peculiar stone, — large, egg-shaped, and well worked, — and three shell ornaments (similar to Fig. 14 on Plate X.).

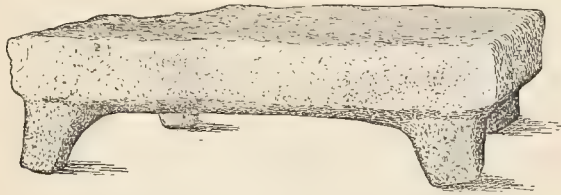


FIG. 13. — METATE, OR GRINDING MILL OF LIMESTONE. CHULTUN 33. $\frac{1}{2}$.

CHULTUN No. 34 is situated seventy feet northeast of Mound 41. It had been sealed, but the stone cover had been upheaved by the roots of a huge cholul tree. The space of the reservoir was completely filled by roots and rootlets, some as thick as a man's wrist, others as fine as a silken thread. The level earth deposit was two feet deep, and was covered with zahcab from the roof and walls. The deposit was damp and mouldy. The excavation yielded bones of quadrupeds, fragments of terra-cotta objects, two human heads of terra-cotta, and a head of a bird of the same material, two terra-cotta whistles, a broken musical instrument of terra-cotta still showing some of the blue paint with which it had been painted (Plate XIII. Fig. 1, *h*); also broken shell ornaments, a bead of lime cement, and a cylinder made from a calcite crystal.

To enumerate or attempt to describe the subterranean reservoirs which furnished no data would only serve to fill up the report with useless matter. Many of these were so situated that they naturally received all the washings of the neighboring mounds, and they were often filled nearly to the mouth with débris closely packed by the rains and hardened by ages into an almost stone-like mass, which made the work of excavation extremely difficult. We carefully investigated every chultun that could be worked with any

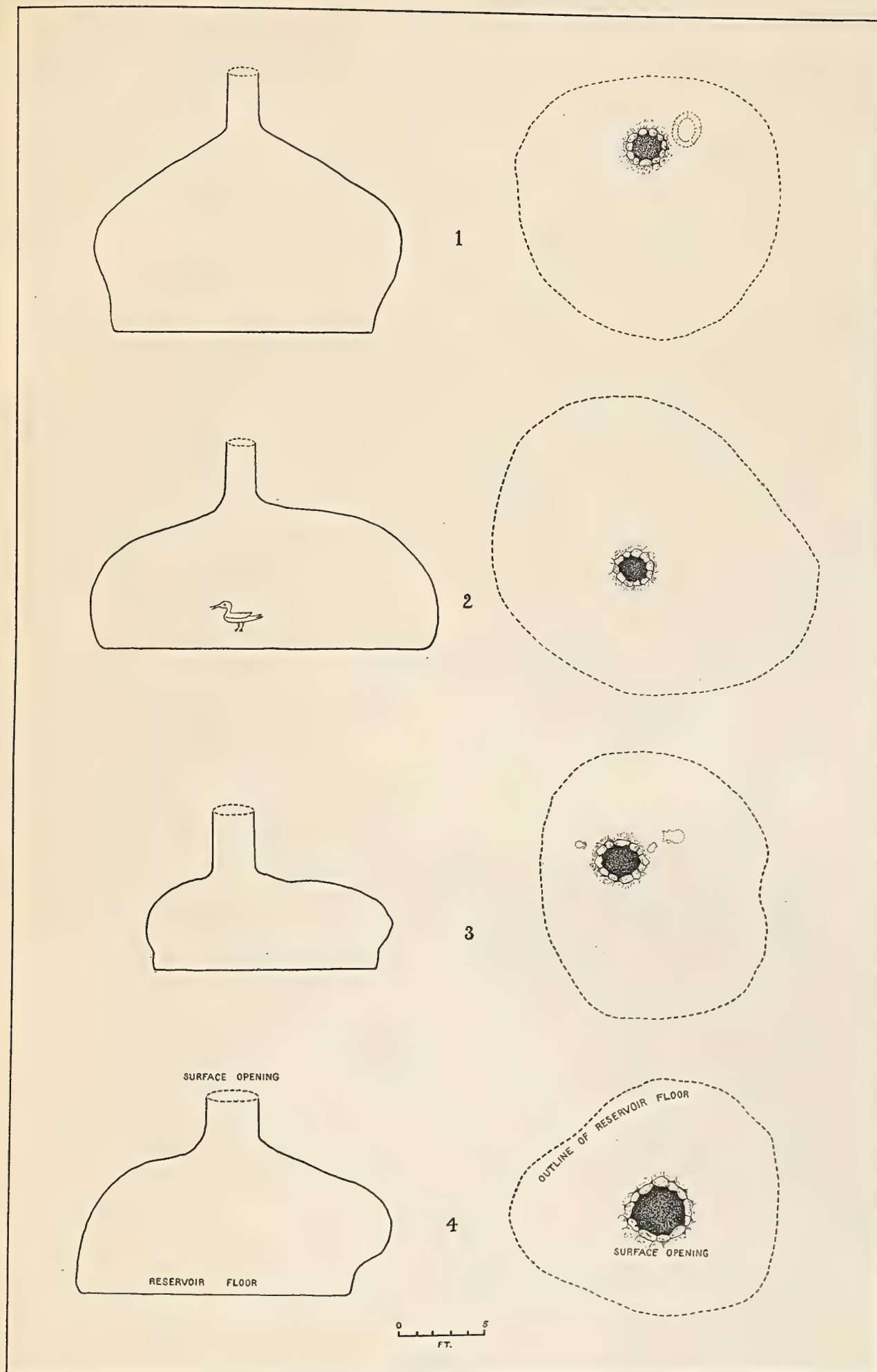
chance of success. We found many new ones unknown to us during our first expedition; and while others undoubtedly still lie buried many yards beneath the masses of the fallen walls and covered by the dense vegetation, we feel certain that most of the chultunes in this ruined group of Labná have been located and thoroughly explored.

The results of this investigation would seem to prove, among other facts, that the sealed reservoirs were used as ultimate depositories for the dead. The greater number contained human bones or traces of them. In the case of two skeletons only could the actual position of the bodies be ascertained. Probably the others were removed from some previous receptacle and deposited in the chultun, together with the burial offerings, the earth heaped upon them, and the chultun converted into a tomb and sealed. The two skeletons, found apparently as the bodies had been placed after death, may have been exceptionally preserved by natural causes, and thus in this condition have been re-interred like the others.

I found no evidences of cremation. There was charcoal in these reservoir-tombs and ashes also, and I found a few charred bones, but so far as ascertained the bones were not human. I found no artificially split human bones or any other traces of cannibalism.

The numerous beads and pendants of gypsum, crystals, jade, chalcedony, and terra-cotta were found singly and scattered, evidently thrown in loosely as death offerings, and not left on the dead or deposited as necklaces or corded pendants.

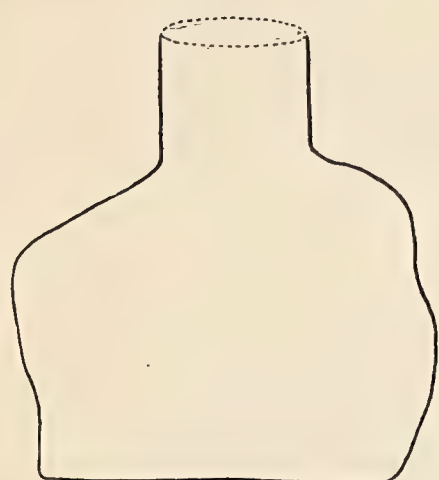
If I am asked why this ancient people converted their precious reservoirs into ultimate tombs, I can only state the fact and cannot give the reason. It may have been because of the very preciousness and absolute necessity of these reservoirs that the people gave them up to their revered dead. In some lands the mourning one gashes his body, sacrifices his animals, his human slaves, and even his own life, to the memory of his dead lord and master. In this almost universal prompting of the human heart may we not find the solution of this strange problem, — the use of the sealed chultunes of Yucatan?



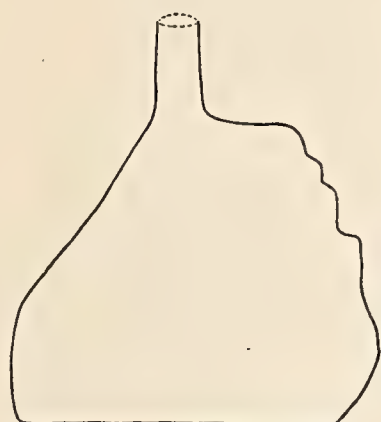
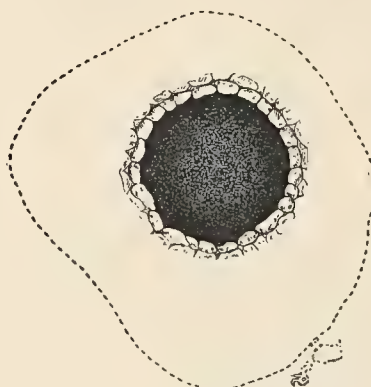
VERTICAL SECTIONS EAST AND WEST THROUGH
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HORIZONTAL SECTIONS SHOWING OUTLINE OF FLOOR
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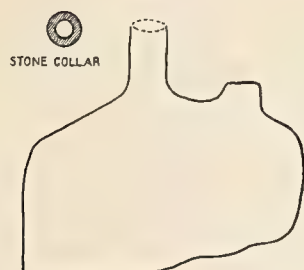
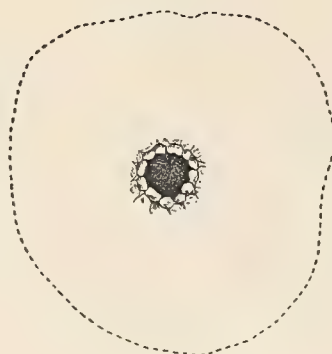
THE CHULTUNES OF LABNÁ, YUCATAN.



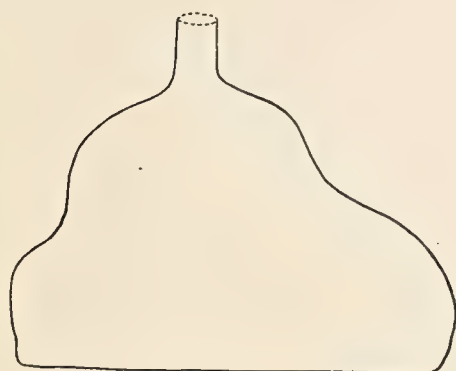
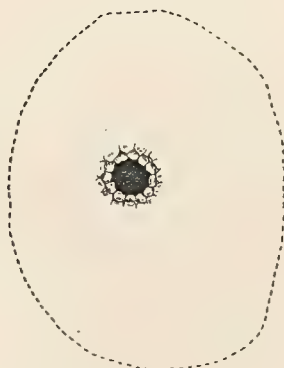
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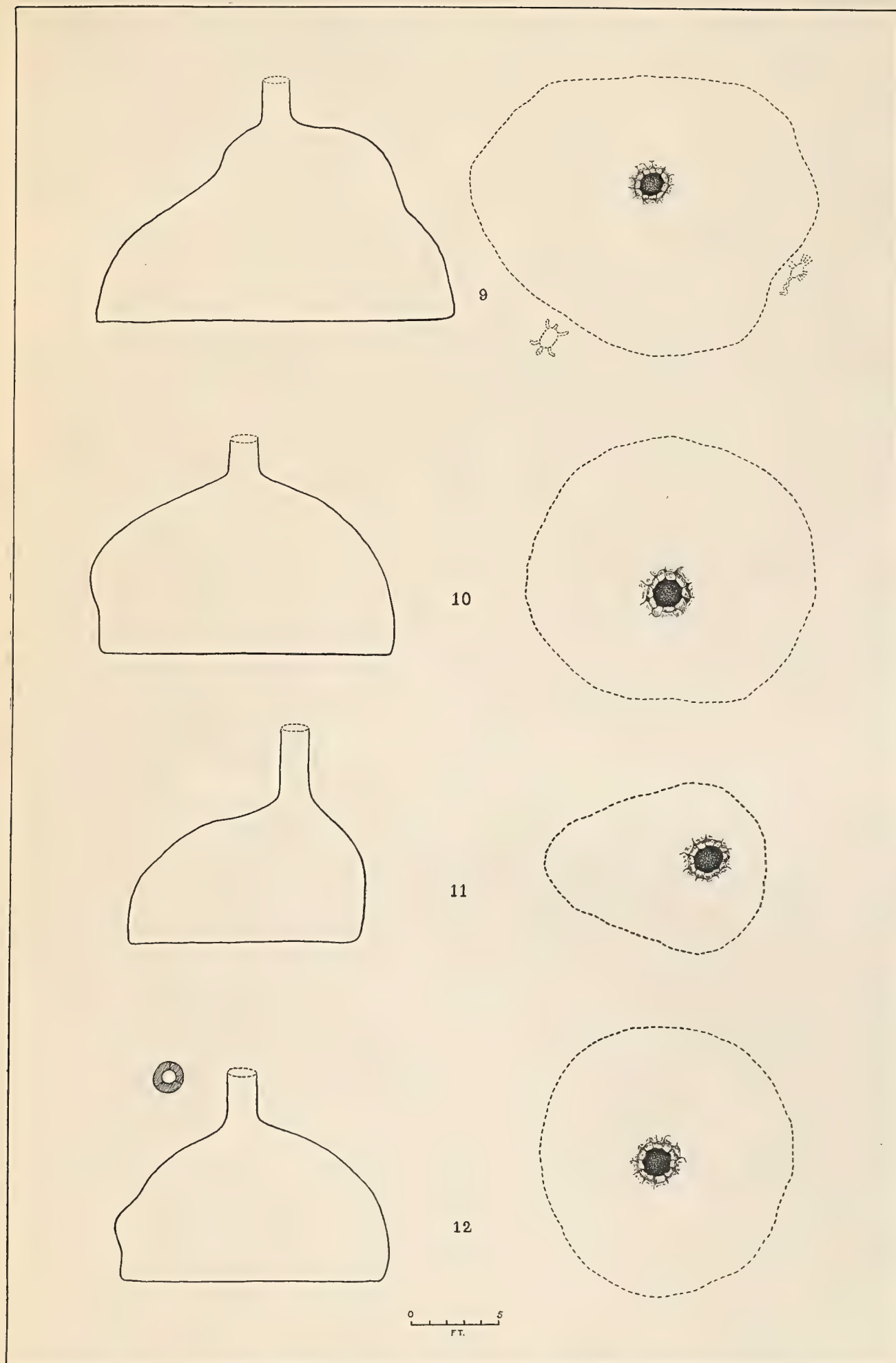
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VERTICAL SECTIONS EAST AND WEST THROUGH
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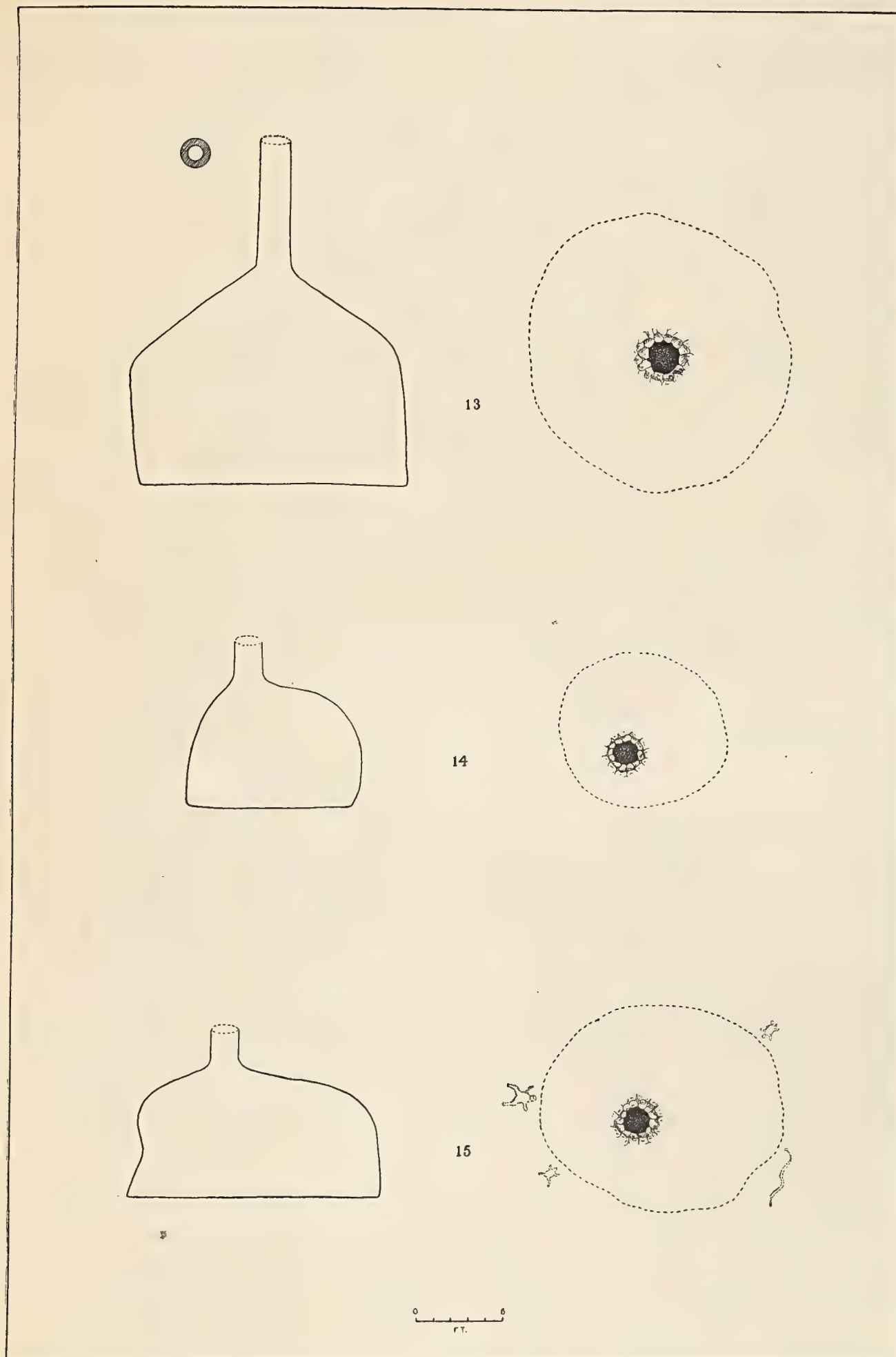
THE CHULTUNES OF LABNÁ, YUCATAN.



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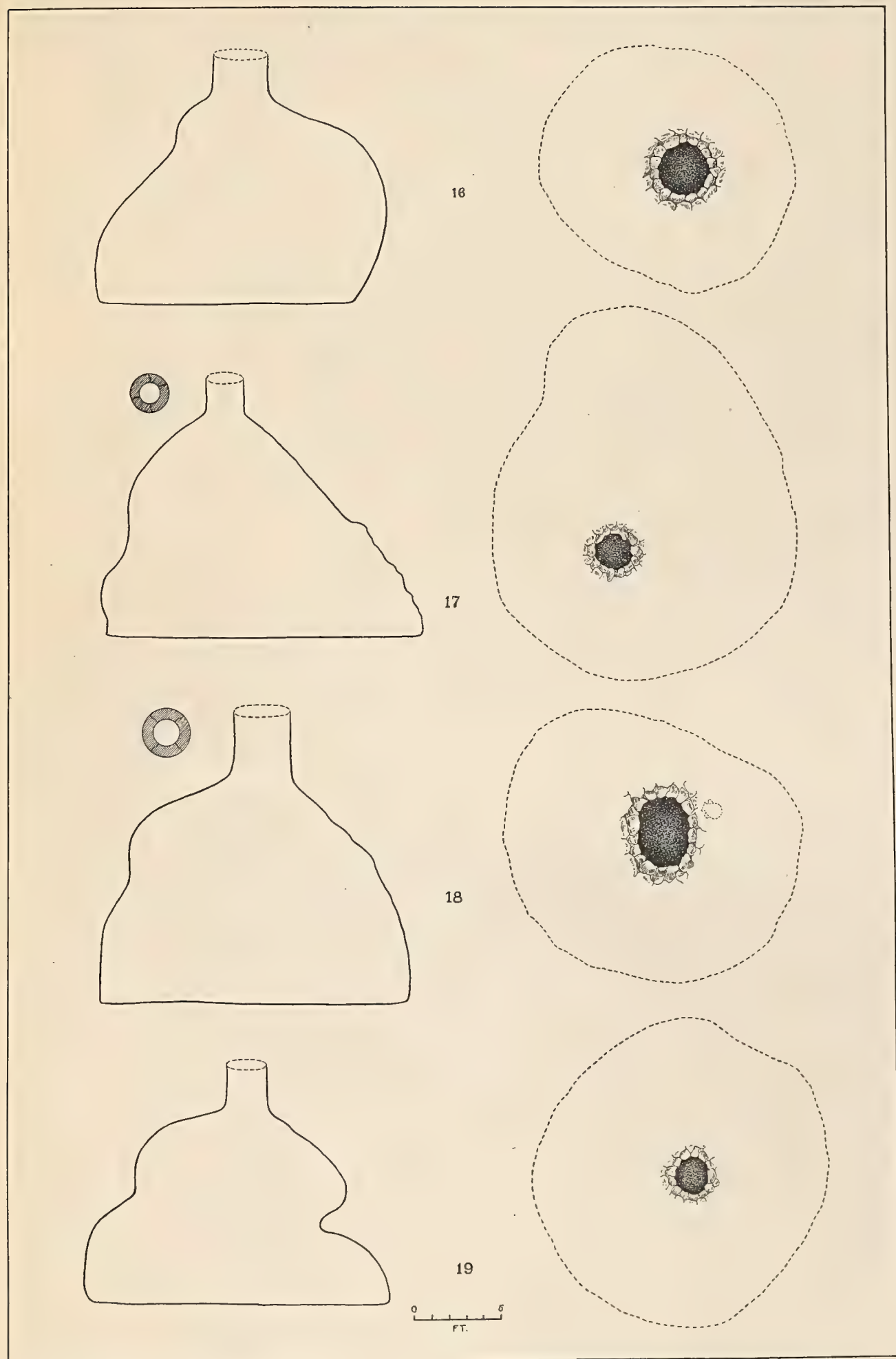
THE CHULTUNES OF LABNÁ, YUCATAN.



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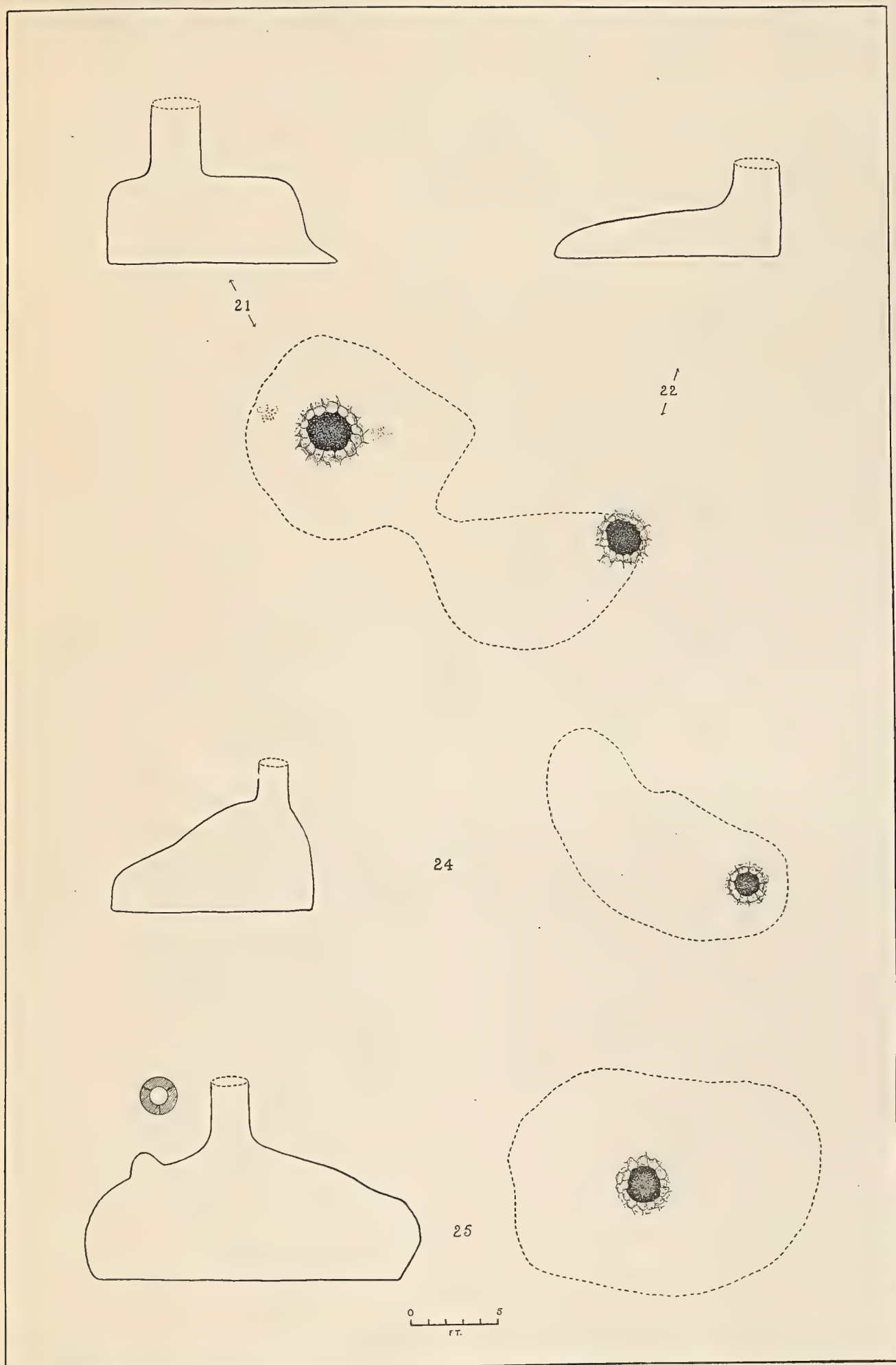
THE CHULTUNES OF LABNÁ, YUCATAN.



VERTICAL SECTIONS EAST AND WEST THROUGH
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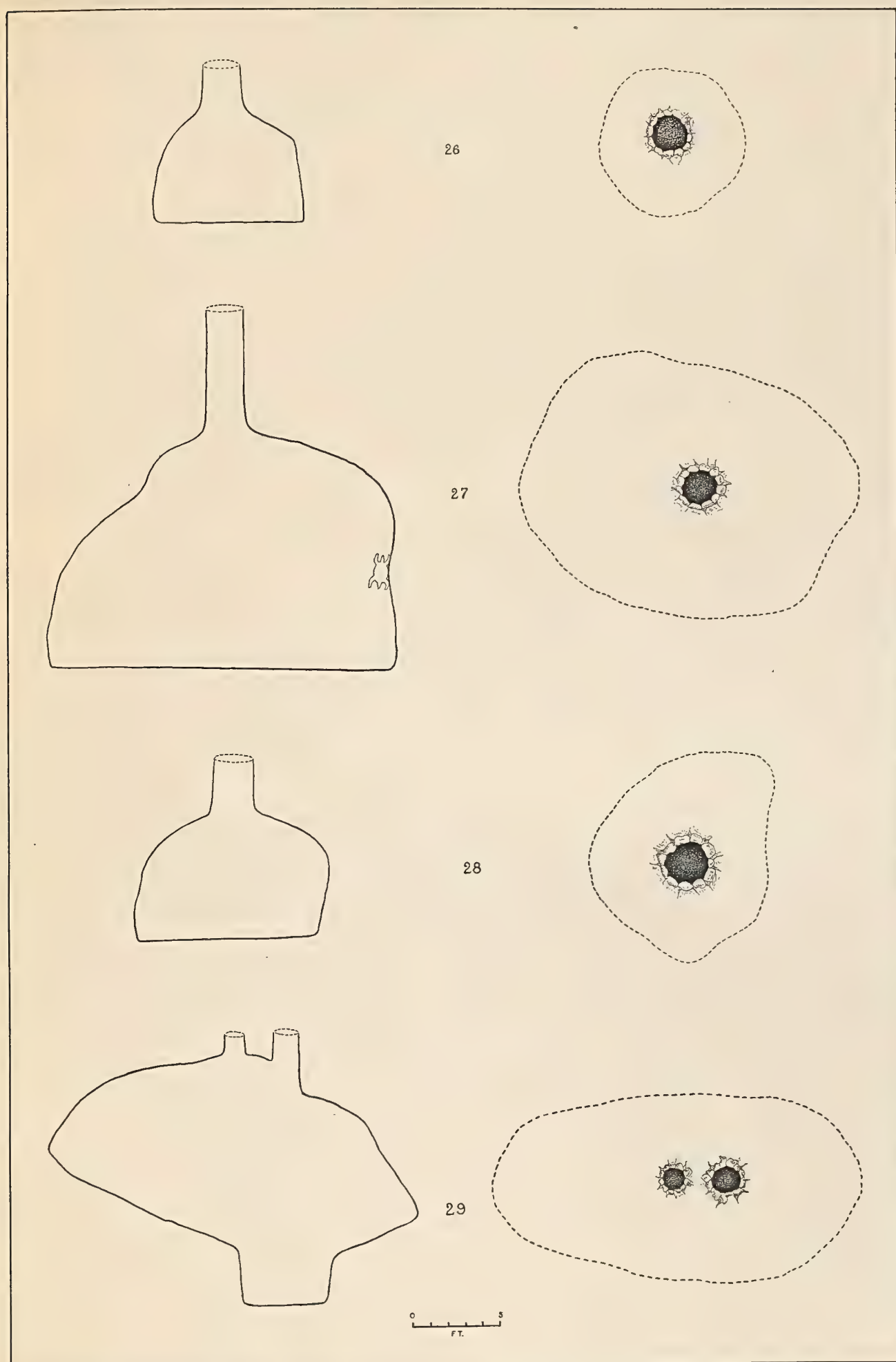
THE CHULTUNES OF LABNÁ, YUCATAN.



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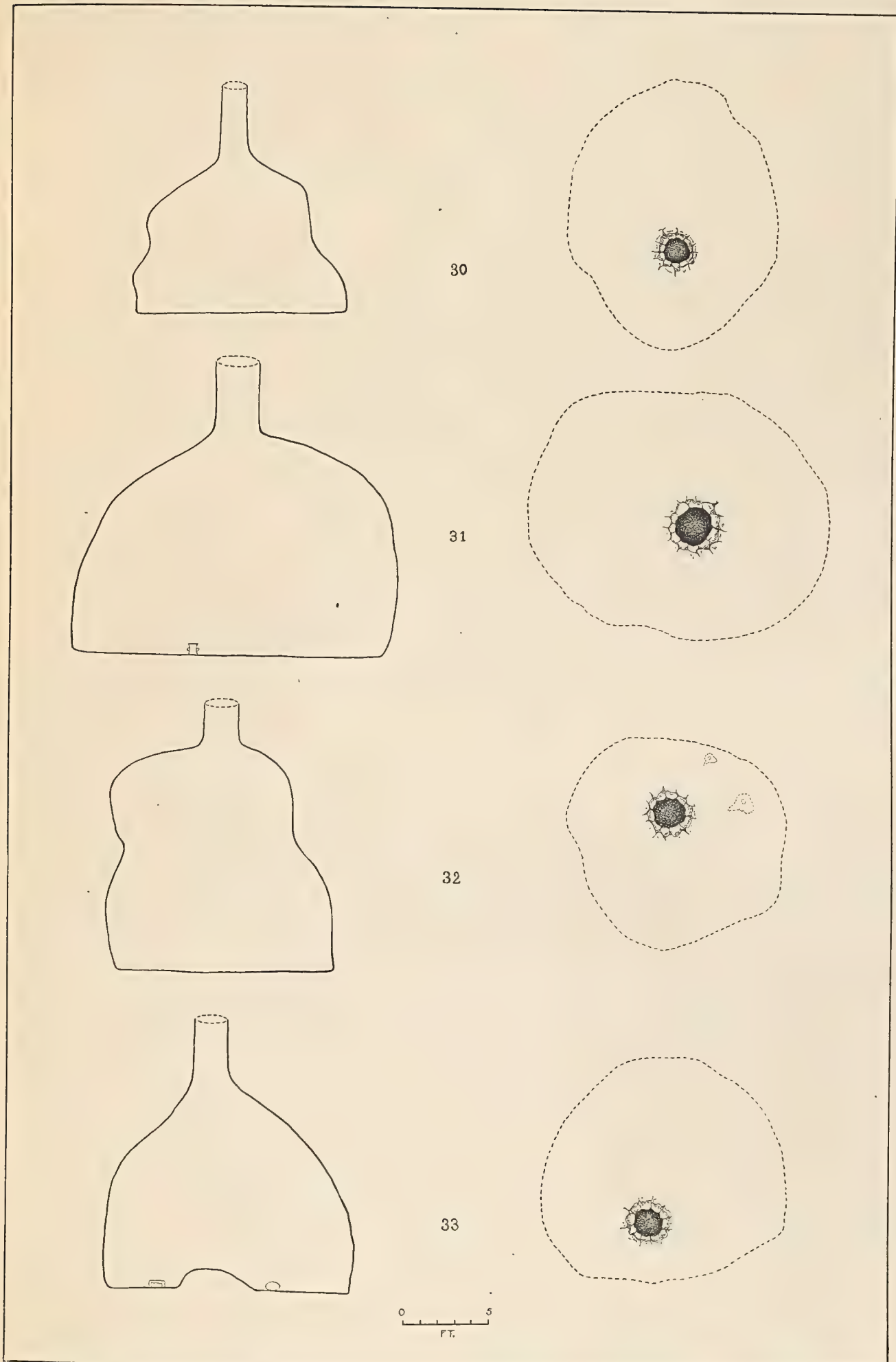
THE CHULTUNES OF LABNÁ, YUCATAN.



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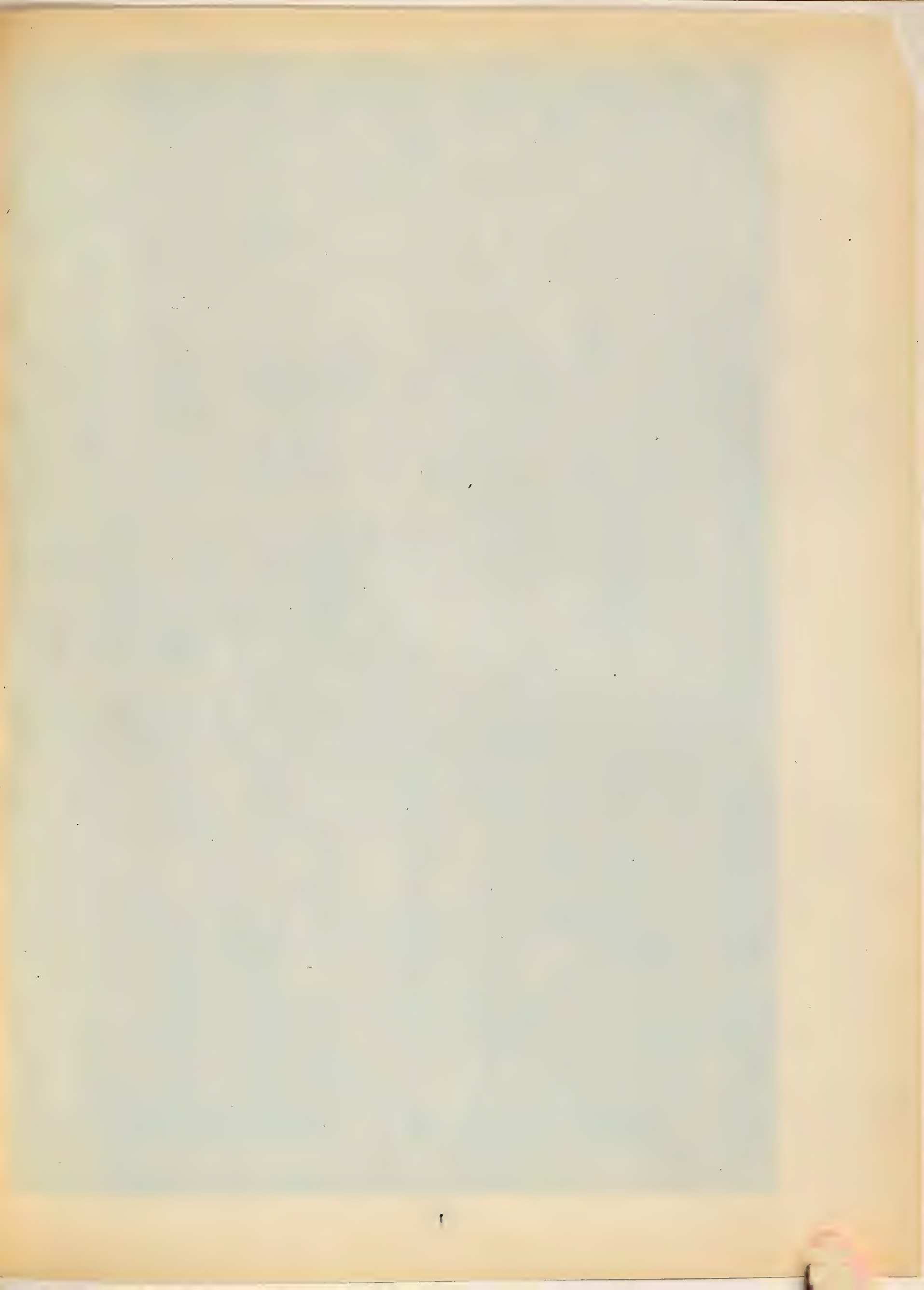
THE CHULTUNES OF LABNÁ, YUCATAN.

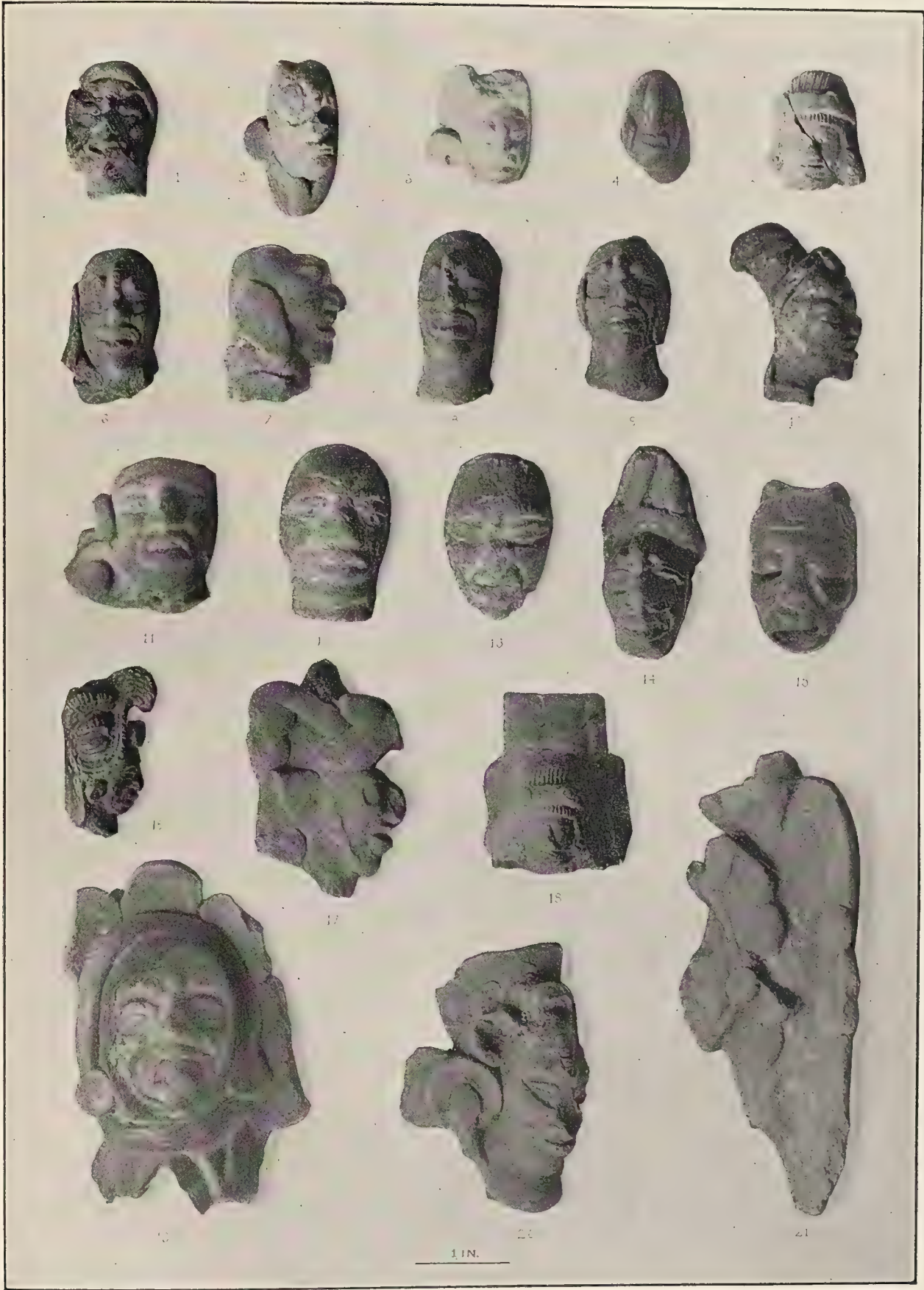


VERTICAL SECTIONS EAST AND WEST THROUGH
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THE CHULTUNES OF LABNÁ, YUCATAN.



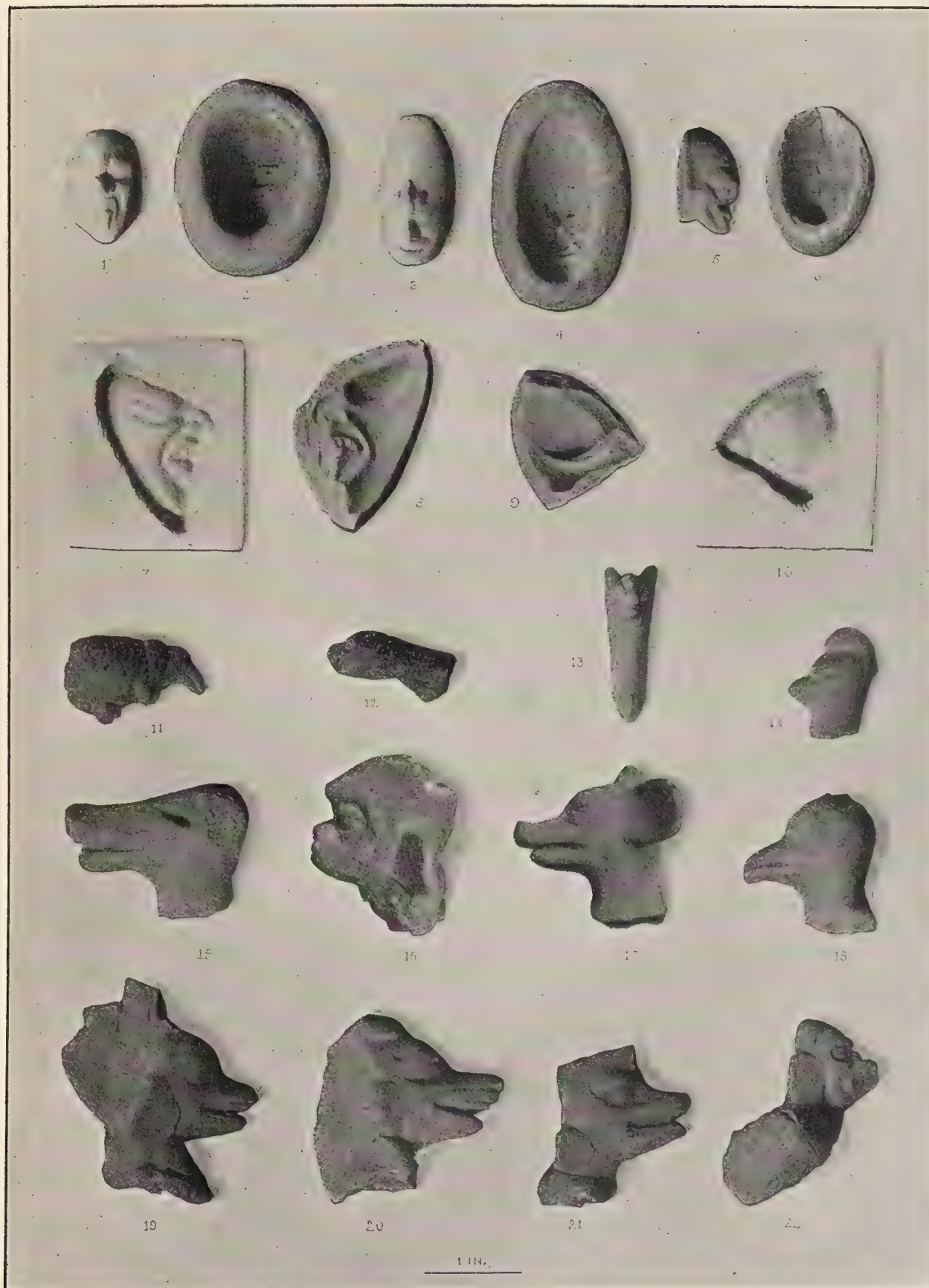


TERRA-COTTA HEADS FROM THE CHULTUNES OF LABNÁ, YUCATAN.





ORNAMENTS FROM THE CHULTUNES OF LABNÁ, YUCATAN.
1-23, Shell. 24-28, Stone. 29-50, Lime Cement.



FIGS. 2, 4, 6, 8, AND 9, TERRA-COTTA MOULDS FOR CASTING CLAY HEADS. CHULTUNES OF LABNÁ.
 FIGS. 1, 3, 5, 7, AND 10, CLAY CASTS FROM THE ABOVE MOULDS. FIG. 11, TERRA-COTTA BEETLE. CHULTUN 26.
 FIGS. 12-22, TERRA-COTTA HEADS OF QUADRUPEDS AND BIRDS CAST IN MOULDS. CHULTUNES OF LABNÁ.



FIG. 1. WHISTLES AND PORTIONS OF MUSICAL INSTRUMENTS FROM THE CHULTUNES OF LABNÁ, YUCATAN.



FIG. 2. POTTERY VESSELS FROM THE CHULTUNES OF LABNÁ, YUCATAN.



POTTERY ULOA VALLEY. COLORED DECORATIONS, GROUPS A, B.

MEMOIRS

OF THE

PEABODY MUSEUM OF AMERICAN ARCHAEOLOGY AND
ETHNOLOGY, HARVARD UNIVERSITY.

VOL. I.—No. 4.

RESEARCHES IN THE ULOA VALLEY,

HONDURAS.

REPORT ON EXPLORATIONS BY THE MUSEUM, 1896-97.

BY

GEORGE BYRON GORDON.

CAMBRIDGE:

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EDITORIAL NOTE.

THESE two memoirs, issued under one cover, contain an account of the explorations in Honduras by the Peabody Museum in the years 1896 and 1897. During these years the work at the Ruins of Copan was suspended, owing to the unfortunate position taken by the present government of Honduras in relation to the edict granted to the Museum by the former government. Mr. Gordon has therefore turned his attention to other localities in that region, and has been so fortunate as to find much of interest and importance relating to the antiquities of the country.

The Uloa valley, as shown by Mr. Gordon's researches, was at one time well populated, but was not, at least for any length of time, occupied by the people whose ruined buildings of stone are found on various sites from the Copan valley and Guatemala to Yucatan and southern Mexico. That the Uloa valley was a region visited by several distinct peoples in ancient times seems to be shown by the mixture of cultures, as represented by the pottery and other objects found in the great deposits of refuse exposed along the banks of the river. This commingling of cultures, indicative of the various peoples who have occupied this rich valley of the Uloa, is worthy of an extended research, to which this report by Mr. Gordon opens the way.

The stone covered mounds, discovered by Mr. Gordon, comprise a group similar to others that have been referred to by travellers in the region of the headwaters of the Uloa. These mounds should be thoroughly explored, for it seems probable that an extended research would bring to light something of importance in relation to the people who built them. The one rude sculpture of stone discovered by Mr. Gordon and figured in his report, certainly has a closer resemblance to the rude sculptures from Nicaragua than to the elaborately sculptured monoliths of Copan.

Mr. Gordon's explorations in the caves on the hillsides of the Copan valley do not give evidence of extreme antiquity of man in that region; although the caves were undoubtedly used by man many centuries ago. Here again the culture of the people, as indicated by the few objects found

in the caves, is different from that of the builders of the ancient city of Copan not many miles away, unless the pottery vessels were made for special rites connected with the caves.

All the illustrations in the two memoirs are from drawings by Mr. Gordon or reproductions of his photographs. The specimens figured or specially alluded to in the report form only a small portion of the collection made by Mr. Gordon. The entire collection is arranged in the Museum, and is open to all students.

As in former years, the expense of these explorations and of the publication of these memoirs has been met by the contributions of generous patrons of American research. Mr. Charles P. Bowditch and the Honorable Stephen Salisbury have shown a special and substantial interest in the Central American explorations. To Mr. Bowditch I am personally indebted for his unceasing devotion to this research, and for his personal supervision of the many details involved in carrying it on.

F. W. PUTNAM,
Curator of the Museum.

HARVARD UNIVERSITY, CAMBRIDGE,
JUNE 6, 1898.

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RESEARCHES IN THE ULOA VALLEY.

IN October, 1894, I arrived at San Pedro Sula, on my way from Puerto Cortez to Tegucigalpa in the Republic of Honduras. The rains which had fallen heavily for some weeks still continued, the streams were swollen, and the condition of the roads was discouraging, — a state of affairs that made travelling extremely difficult. It was during the delay caused by the difficulty of obtaining animals for such a journey that I first received intelligence of prehistoric remains on the Uloa. A resident of the town showed me a specimen of painted pottery which resembled specimens from Copan already familiar to me. The owner of this specimen informed me that it was brought to him from the Uloa River by an Indian who claimed to have found it on the bank of the stream where it had been washed out during a flood. The locality where it was found was given as *Playa de los Muertos*, or Shore of the Dead, — a place that would seem to have received its name from circumstances connected with the buried relics of a former population, which are found in this as well as in other localities along the course of the river. It is probable that when the name was first applied, it was common to see human bones as well as pieces of pottery unearthed by the annual floods, which tear away the banks and sometimes change the course of the river for miles. Even at the present day an occasional skull or fragment of bone is exposed by the same cause.

Before proceeding on my journey I rode from San Pedro to Playa de los Muertos, a distance of about twenty-five miles. The way lay over a level country consisting largely of deep bottom lands, very rich and covered with luxuriant vegetation. On arriving at the place I found that the river, overflowing its bounds, had partly inundated the site of the little native village situated upon its bank, driving the inhabitants from their flimsy huts of poles and thatch. It was evident that further investigations would have to be postponed till a different season.

The explorations which form the subject of this report were carried on in May and June, 1896, and from March till June, 1897. These months being in the dry season, the river was then at its lowest, and afforded the best opportunity for making the investigations.

The two rivers, Uloa and Chemilicon, draining separate mountain systems in the interior, converge as they approach the coast, and, traversing the broad plain which forms their common valley, empty into the Gulf of Honduras at points not more than eight miles apart. At one time, perhaps not very remote, when their respective volumes of water were much greater than now, the two rivers became united long before they reached the coast, and formed a broad stream whose waters were spread over a great part of the region that lies between the present water-courses. Then, when the volume of water decreased, owing to climatic changes dependent on variations of geological conditions or other causes,* the point of confluence advanced gradually towards the coast until at last the two streams reached the sea by independent courses and by different mouths. The waters of the Uloa and its tributaries, which form the larger stream, confined themselves to the east of the valley, and the Chemilicon became confined to the west. It is not probable, however, that their separate existence when once established remained constant. Subsequent variations and temporary changes in the conditions governing the amount of discharge caused their swollen currents to reunite at different periods. Even at a time so recent as to be within the memory of the present inhabitants, owing to a sudden increase in their respective volumes, the two streams became united for a short time near their mouths. In times more remote this reunion would have been much more extensive, and would have involved the flooding of a great part of the valley and the destruction of any human society that may have been developed on its productive soil. It will be well to have these considerations in view when we come to examine the actual conditions underlying the superficial aspect of this region to-day.

The whole valley is covered with an almost unbroken forest, and there is not to be found above the surface more than very insignificant vestiges of a former population; nor is there in its whole extent a town or a village

* The changes here indicated are apparent from the conformation of the valley and the continuous deep river deposits from the east of the Uloa to the west of the Chemilicon. The interior of the country furnishes abundant evidence of similar changes uniform in character with the drying-up process, which according to numerous observations has been going on over the land surface of the earth through later geological and historical time. This evidence of a diminution in the amount of water standing and running in the interior of Central America, although not so marked as in many parts of the world, is nevertheless ample. The much broken Cordilleras are in many places intersected by deep cañons which could have been formed only by running streams of considerable volume, and which now contain water only for a short time and irregularly during the period of greatest precipitation. More striking are the signs of dried lakes. The wide depression known as the plain of Comayagua was at one time occupied by a lake whose boundaries are marked by ancient terraces and shorelines, and whose outlet was the Humuya, a branch of the Uloa. That there has been a perceptible change in the amount of flowing water in recent times would seem to be indicated by the presence in different localities of ancient village sites, marked by ruined houses and other structures of stone, upon the borders of what are now dried watercourses or channels containing water during a short part of the year only. Since there is at present no convenient water-supply for these long-abandoned communities, it is only reasonable to suppose that at the time when the sites were chosen the amount of precipitation was greater than it is now.

or a single hut that does not stand upon the buried relics of what must have been a very extensive and flourishing community. One can scarcely dig a drain or excavate a fox's hole without coming upon some relic of former industry. At San Pedro, along the whole line of the railroad that runs for fifty miles through the valley, or wherever excavations have been made for any purpose, the experience has been the same. It is not possible to excavate the whole valley, but where the rivers have cut their channels through the old alluvial beds, and particularly in the terraces of the Uloa, we have an opportunity of observing the conditions that have been described. In the lesser channel of the Chemilicon the same conditions pertain, but to a less extent.

Embarking at La Pimienta and passing down the Uloa in a canoe, the chief details that at first impress themselves on the spectator are as follows.

The course of the river is rather crooked, and at each turn the bank opposing the direction of the current and receiving all its energy, is undergoing constant encroachments, which in flood times are considerable. Consequently this bank takes the form of a vertical cutting, presenting a cross section of unconsolidated strata of sand and clay about thirty feet in height and lined on top with dense masses of manaca palms and other trees.

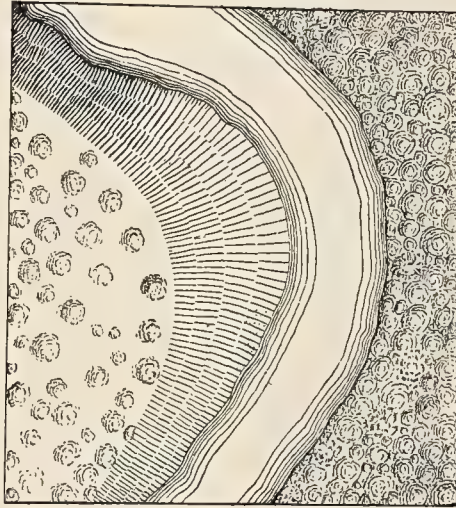


FIG. 1.—TYPICAL FORM OF RIVER BED.

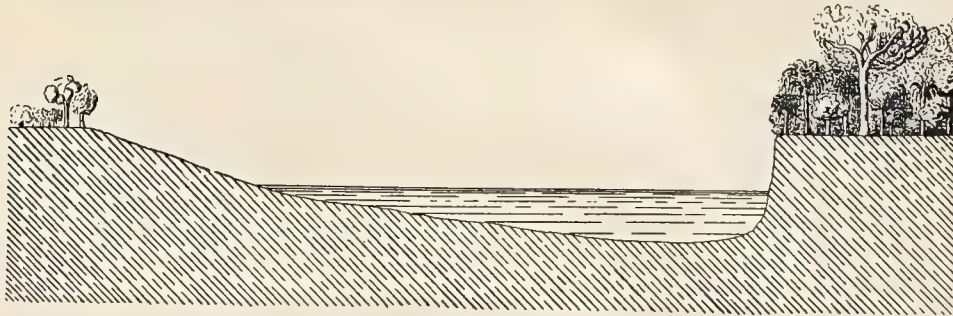


FIG. 2.—TYPICAL SECTION OF RIVER BED.

The opposite bank, which occupies the inside of the curve and is consequently receiving additional depositions from the river, takes the form of a sloping beach of sand and gravel, often attended with drifting sand and dunes. This is the typical condition, and serves to indicate the process that is going on (Figs. 1 and 2). These vertical banks, where the old alluvial

strata are freshly exposed and well in view, present the continuous spectacle of broken pottery and fragments of bone from the surface of the water up to within a few feet of the top. In places these objects are very numerous for stretches of several hundred feet, then diminishing gradually and sometimes almost disappearing for miles. They are most numerous in streaks or strata at various levels, with intervals of several feet between in which they are scarcely noticeable or entirely absent, as appears to be the case sometimes. In order to gain further knowledge of the situation, it was necessary to select the localities that promised the best results, and excavate. Since the details of the work, the methods employed, and the conditions involved remained the same throughout, it will be well to give only a summary of the work, and such incidents connected with it as may be of interest or importance, before proceeding to bring together the results in their proper relations.

The inhabitants of this region are different in many respects from the natives of the mountainous districts in the interior. Their ethnological antecedents would be difficult to trace, but I am convinced that there is an infusion of Carib blood which in its later constitution involves a strong Negro element. The physical resemblance to the modern Carib of the coast is in some individuals very noticeable, and in many respects the disposition of these people resembles that of the Carib; their exclusiveness and aversion to dealings with strangers are marked Carib traits. Since the latter are averse to mixing with people of different blood from their own and have a strong attachment to the salt water, the present instance of departure from deep-rooted customs must have been brought about by refugees or outcasts. For the rest, the racial antecedents of the people who are met with in the village communities on the banks of the Uloa River are derived from the Xicaque Indian and the Spaniard.

From La Pimienta to the mouth of the river there are twenty or thirty of these villages varying in size from half a dozen to fifty or sixty huts, often completely hidden among the trees and rarely attended with any clearing or cultivated fields. The inhabitants follow the usual occupation of doing nothing. There is abundance of fish in the river, and the forest is full of game, but they seldom take the trouble of procuring either, preferring to subsist on green plantains alone. In respect of industry they certainly do not take after their Carib progenitors.

The village of Santana is situated in a bend of the river where it makes a large loop, affording long stretches of high vertical banks, and therefore offering a suitable field for excavation, since by passing under the banks in a canoe the most likely spots could readily be chosen. Here the three most important excavations were made.

After a clearing had been made on the margin of the bank at the point selected, an arbitrary stratum four or five feet in depth was removed

over an area extending one hundred feet along the edge of the bank and an equal distance in the other direction. Then a second stratum of the same depth was removed, and so on down to the level of the water. In the first of these strata there were few objects. In an excavation at Playa de los Muertos the objects appeared to continue in increasing numbers, from their first appearance down to the level of the water; but it must be said that the conditions here were not so favorable for observation, as it rained almost continually while the work was in progress, and the sides of the excavation were constantly falling in. We will therefore proceed to a consideration of Excavations 2, 3, and 4.

In No. 2 the objects occurred in three principal layers, each about two feet thick. The first occurred at a depth of eight feet, the next at a depth of fifteen feet, the third at a depth of twenty-five feet. These layers were not clearly defined, however, and the intervals also contained objects, though in much smaller numbers. These objects did not differ in general character in the different layers, either in this excavation or in the others. They grew less numerous towards the bounds of the excavation, as indicated on the face of the bank, and almost disappeared in every direction; but not entirely, for no matter how far the excavation was carried something would be found at intervals. It will be understood that the site of each excavation and its dimensions were determined by indications on the face of the bank.

In No. 3 there were again three principal layers, at depths of twelve, twenty, and twenty-five feet. The last was in this case by far the most extensive of the three.

In No. 4 the objects occurred in four principal layers, at depths of six, twelve, eighteen, and twenty-six feet. In the case of the first of these layers the greater part of the objects occurred in a thickness of one and one-half feet. In the second they occurred principally in a range of three feet. The third was about the same as the first, and the fourth smaller.

In general there was an interval between the different layers in which scarcely any relics occurred, and it is also to be noted that the lower limit of each layer was better defined than the upper; that is to say, in going downwards the objects increased in numbers more gradually and ended more abruptly; but in no case could you say where the layer began or ended. It is impossible to say how far the relics continue below the bed of the river, but that they continue below the surface of lowest water is evident. In all cases the objects, which consisted chiefly of fragments of pottery, were distributed through, and so intimately associated with, the strata of sand and clay in which they were embedded that they had every appearance of having been laid down simultaneously with these strata. The stratifications were fairly well defined, and though somewhat uneven were continuous and horizontal.

It was rarely that an entire object was discovered, and the fragments of those that were broken were sometimes scattered. Different fragments of the same vessel were often found several yards apart, while in a few instances nearly all the pieces of a shattered object were found within a radius of two or three feet, all being on the same or nearly the same level. Small fragments of bone were encountered regularly in the same levels with the other objects; and although there were no well-defined burials and nothing of the character of tombs, the fragments of bone, although their evidence is rather meagre, must be regarded as indicating burial-places in which the human remains have all but disappeared. The only point of special interest attaching to these remains is the filing of two front teeth, in a set found at a depth of twenty feet, in a manner similar to those found in the tombs at Copan. In Excavation 4 two skeletons much decomposed lay a few feet below the surface, but no objects were associated with them. In this instance there were several mounds scattered over the surface, and the burials are, I think, to be referred to these, which must have been of later origin than the remains embedded in the banks; for although nothing was found in these mounds themselves, the strata beneath them contained the usual objects, as already described.* At the points where the other excavations were made the surface was perfectly level, and without any indications of a former population. These are the main facts obtained in the excavations; their bearing will be discussed further on, after an examination of the material brought together.

One day I came upon a solitary Indian who lived by himself in the forest. He was held in great terror by the people on the river, being, as they said, a low savage and not a Christian. He was called Nicho, a contraction of Dionicio. After our first encounter I met him so frequently that I suspected he was putting himself in my way; but though he was a surly dog and somewhat irascible, he never showed any hostility toward me. Since it was notoriously his habit to shun his fellow-men, I wondered at this display of sociality. It was explained afterward when he told me that I was better than the people on the river,—a conclusion which indicates a singularly correct knowledge of character. It was not long before we became quite friendly, and as he knew the forest thoroughly I decided to

* These mounds are irregular in shape, and built of water-worn stones and earth. They vary in size from scarcely perceptible elevations a few feet in diameter to as much as thirty or forty feet broad and from four or five to twelve or fifteen feet in height. In this particular locality there may be fifty or sixty such mounds scattered over an area of two or three acres. Groups like this are found here and there over the entire valley. The word used by the Spanish-speaking natives of this region to describe these mounds is *calpulis*, the plural of the Nahuatl word signifying "clan;" and a modern village situated between the Uloa and the Chemilicon is called Los Calpulis on account of its proximity to a group of these mounds. The significance of the word as applied in this way is not apparent, but that Nahuatl words should have found their way to these parts after the conquest is to be expected, since in this very valley the march of Cortez and his Mexican allies to Honduras terminated in 1526.

employ him as my guide. It was under his guidance that I found the only group of mounds of any especial interest that I saw in this vicinity. They are situated about six miles eastward from the river, near the base of the mountains. There are numerous mounds scattered over an area of about ten acres, but the most notable group occupies a much smaller space in the southeastern part of the area (Fig. 3). The southeastern extension of this group consists of a quadrangular enclosure surrounded by a ridge of rough stones raised to a height of about five feet. The eastern part of the enclosed

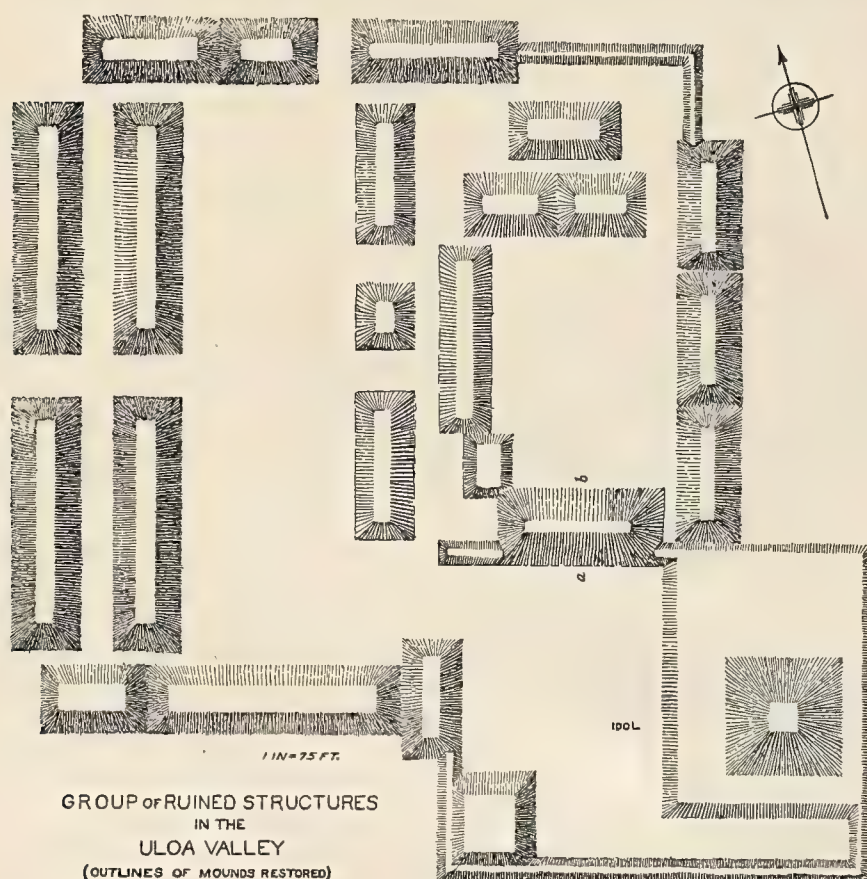


FIG. 3. — PLAN OF RUINS EAST OF THE ULOA RIVER.

area is elevated to the level of the surrounding ridge, and upon this elevation stands a square pyramidal mound, about forty feet in height, terminating in a rounded point. In front of the raised area, opposite the centre of the mound, is an idol, broken in three pieces. The lower part was standing when found, and the other two still retained evidence of the blows by which they had been broken off. A sketch of this idol in its present condition with parts replaced is shown on the next page. It stood about seven feet high, was sixteen inches in diameter, and was rudely carved from

a hard igneous rock, almost black in color (Fig. 4). It would seem to have been the chief object of worship in the community. In fact I saw no other carving at all, and only one other stone in the form of a pillar. In

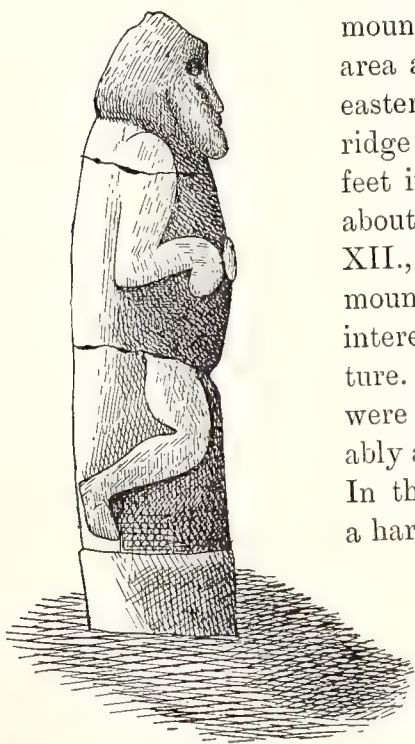


FIG. 4. — STONE IDOL.

the northwestern corner of the enclosure is another mound about ten feet in height, having a level area about fifty feet square on top; while in the eastern side occupying the place of the enclosing ridge is another mound one hundred and twenty feet in length, sixty feet in width at the base, and about thirty feet in height. An excavation (Plate XII., Fig. 3) was made through the centre of this mound (*a b*, plan), which resulted in nothing more interesting than a knowledge of its interior structure. A few very small fragments of rough pottery were indeed found, but their occurrence was probably accidental and they were of but small interest. In the interior of the mound was a core made of a hard homogeneous mass of red clay. This would

seem to have been the original mound. On its top was a smooth floor or platform of hard burnt clay; fires had been built upon it, but the ashes had been swept clean from the hardened floor and lay in masses over the sloping sides of the mound. Afterward the whole had been covered with

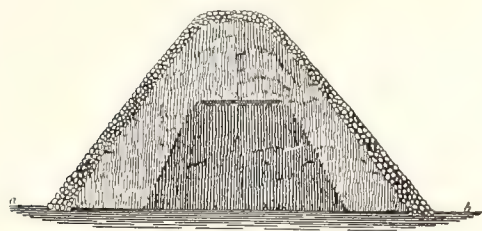


FIG. 5. — CROSS SECTION OF MOUND.
a b, plan.

earth, and the mound, thus raised to nearly twice the original height, had been covered with rough stones (Fig. 5). An excavation was also made into the side of the large square mound, and its structure was found to be the same. At some distance north of the principal group of ruins is a smaller group consisting of a square enclosed by long mounds. In this square was a small mound not more than three feet high. In its centre was set a small plain pillar, a column of schistose rock formed by natural cleavage. It stood about four feet in height above the surface of the mound, while two feet of it were beneath. I had the entire mound removed, and dug beneath the column to the natural level, but found nothing. Other excavations were made in mounds of various shapes and sizes, in the hope of finding tombs, but none could be located.

While clearing away the debris at the base of the carved idol, I found three rude beads, a broken pendant (Fig. 6), and some fragments of a small tablet, all of crystalline limestone. This stone is almost pure white, with streaks and touches of delicate green, owing to the presence of chrome muscovite, flakes of which are distributed through the limestone crystals, giving the mineral the appearance of certain varieties of jadeite.

During the three weeks which I spent in camp at these ruins, I made several excursions along the lower slopes of the mountains. The object of one of these journeys was to visit a wonderful enchanted pool in a deep ravine that Nicho was acquainted with. I had heard of this interesting place from others, but no one except Nicho had seen it, although all were familiar with its magic echoes. This ravine sometimes sends forth a loud melodious sound which may be heard many miles away and is regarded by the people of the region as an infallible sign that it is going to rain. In fact it is a regular weather bureau, with this peculiarity, that it is always reliable; for the sound is so modulated as to indicate by its pitch whether the coming storm is to be heavy or light. The amount of promised rain is in exact proportion to the volume of sound, and thus it proclaims to the accustomed ear with unerring precision the approach of a passing shower or heralds the terrific thunder-storm of the tropics; and this is no fiction, but a fact which any one may demonstrate for himself by going and listening to it. On account of these phenomena the place is called *La Quebrada Encantada*, The Enchanted Ravine.

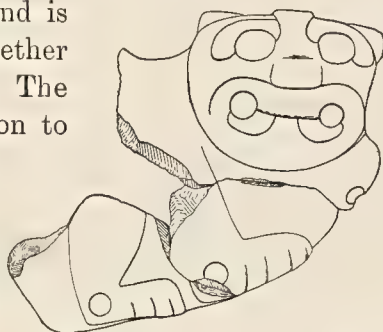


FIG. 6. — PORTION OF BROKEN ORNAMENT CARVED FROM CRYSTALLINE LIMESTONE. $\frac{1}{2}$.

The account which I obtained from Nicho was not told in sequence as it is given here. Nicho was neither romantic nor communicative, and I had to draw his story from him almost word for word by dint of much cross-questioning and systematic prompting. But granting, if necessary, that my suggestive solicitations may have stimulated his imagination rather than his memory, there can be no doubt that what he had to say indicates the general drift of some old tradition of which some scattered remnants still survived in his unreceptive and unmindful brain.

It was while cutting our way through the tangled undergrowth in the forest in search of the Quebrada Encantada and its mysterious pool, that I learned in the manner I have described the secret of its strange behavior. According to Nicho, this pool is the abode of a golden dragon. In former times, before the Spaniards came, it was lined with golden pebbles and the sands at its margin were grains of gold, and it was the custom of the golden dragon to rise occasionally to the margins of the pool and receive the offerings

that were made to him by the people. If they wanted rain they would bring their offerings and lay them on the golden sand beside the pool, or cast them on the water; then, while all the people chanted a prayer, the dragon would rise from the cave where he dwelt in the depths of the pool, and take the good things that were offered him, and there never was a drought or a famine in the land. Then, when the Spaniards came and the people were driven from their homes, the golden pebbles and grains of gold disappeared, and the golden dragon, retiring into the uttermost corner of his watery cavern, withdrew forever from the upper world. There he still lives and, as formerly, controls the clouds and the winds that bring the rain. The spirits of the Indians, too, still hold their meetings of an occasional evening by their accustomed pool, now lost in the solitude of the forest, and it is the sound of their chanting that makes the voice of the ravine. The monkey hears it and returns an answering cry, the jaguar hears it and retires to the shelter of his den, and the lazy half-caste native, propelling his clumsy canoe along the river, pauses for a moment as it strikes his ear, then, muttering the name of his patron saint, swears that a storm is near, and rouses himself to more telling exertions.

When we had made our way through the forest for a distance of about two miles from camp, we arrived at a deep dark ravine, into which we descended, holding on to roots of trees and projecting masses of dark gray rock. In the bottom there was a stream up which we continued to journey with much difficulty for a distance of half a mile or more. We seemed to be entering the very heart of the mountains whose dark masses towered above us. As we proceeded, the ravine grew narrower, the sides higher and more precipitous, and we had to increase our exertions as the way became steeper and the masses of rock over which we had to climb higher and more dangerous. At last we arrived at our destination, and further progress was impossible. The first thing that attracted attention was a cataract that came tumbling down the side of the mountain, and after a final leap of fifty feet was precipitated into a pool some forty feet in diameter and very deep. This pool is surrounded by vertical masses of hard fine-grained rock, except at the outlet in front. At the foot of the fall the water is thrown into violent commotion and forms a seething whirlpool, while towards the margins there is scarcely a ripple, and so clear is the water that I could count pebbles at the bottom fifteen or twenty feet below the surface.

The refreshing coolness of the place was a pleasant contrast to the closeness of the forest and the heating exertions of the journey, while its wild romantic charm was in keeping with its legendary associations, and made it a fitting place for the performance of sacred rites and mysteries. It is just such spots that man in a state of nature endows with supernatural gifts, or associates with his ideas of power and wisdom. Paying divine honors to that which inspires in him feelings of admiration and awe, he

identifies it with the spirit whom he worships as the Author of all things, or with some lesser divinity who represents one of his attributes as ruler over the powers of nature. In other lands this spot would have been a favorite haunt of naiads, or a rendezvous for the alluring nixies; but the savage mind dwells darkly on the grim and terrible in nature, and so to the sombre imagination of the Indian it was a dragon who kept guard over the sacred pool and dwelt in its enchanted depths.

Everything about the place seemed to confirm the legend, even to the disappearance of the gold; and the veracity of Nicho as a custodian of traditionary lore remained unimpeached. The pool had undoubtedly been the scene of some sort of transactions in ancient times. A row of huge bowlders had been placed in a line across its outlet several yards below its margin, and a shelving ledge of rock which projected over the deepest part was worn smooth on its upper surface; but I saw no carvings or symbols of any kind upon the rocks. Curiously enough, however, while digging in the sand and gravel about the edges of the pool, I unearthed a single fragment of painted pottery, with the head of a serpent or dragon clearly outlined in black upon its surface (Fig. 7). The fragment is only three inches across, and the body of the dragon is broken away. I showed this symbol to Nicho, and tried to stimulate his memory by it, but he remained indifferent, and merely shook his head at all my efforts.



FIG. 7. — FRAGMENT OF PAINTED POTTERY VESSEL WITH SERPENT'S HEAD. $\frac{2}{3}$.

It should be added that the sound heard before rain is to be attributed to the waterfall. Ordinarily its sound may be distinguished half a mile away, but before a storm it may be heard for many miles along the river. The phenomenon, although it needs explanation, is in keeping with the well-known habits of running streams and waterfalls. A photograph of the place is reproduced on Plate XII., Fig. 2.

The conditions under which work could be carried on in the thick of the forest were not altogether pleasant. The air was close and hot, and the insects, which at first were scarcely noticeable, gathered in swarms about the scene of our operations. During the day there was no respite from the persecution of flies, and particularly of a small black gnat that came in clouds, assailed every bit of exposed skin, and entered the eyes, nostrils, and mouth; then there was a large yellow fly, with a very painful sting, and another as big as a hornet which attacked the horses in such numbers and with such ferocity that I had to send them to a small clearing on the other side of the river. At night the mosquitoes made it impossible to sleep without the protection of a net, and even then they managed to make their attacks through

the bottom of a hammock of stout sail-cloth. Of course there were snakes, scorpions, tarantulas, and other minor details of life in a tropical forest. It was a forest abounding in wild animals. The most conspicuous of these was a little white-faced monkey with a habit of chattering and an inquisitive disposition, who sometimes surrounded us in numbers and watched our movements very critically from the branches of the palm-trees. There was also a large black baboon who never came near, but seemed to confine himself to the tops of the highest trees. These latter paid no attention to our doings, but sometimes made the night hideous with their bellowing. Then there were deer, tapir, peccary, and jaguar, not to mention many smaller animals such as sloths and ant-eaters. Alarms were frequent in the encampment, where the workmen slept on the ground, as some wild animal came prowling among them in the dead of night; but we never had an actual attack.

About the middle of April, on the arrival of Holy Week, a festival observed in Central America with the strictest attention to that part of the teaching which demands abstinence from any sober or industrious occupation, I broke up camp at the ruins. Disappointed at the result obtained from more than two weeks' labor, I concluded to abandon the mounds and to continue excavations on the river banks when the period of religious abstinence referred to had passed, and my men had time to recover sufficiently from their pious dissipations to begin earning silver with which to celebrate the next similar occasion.

All these excavations involved the same set of conditions, and afforded similar results. Before leaving the region I made a journey to the mouth of the river, making excursions into the forest at intervals, and where it was possible marching through it and joining the canoes at some point farther down. Owing to the density of the forest, it would be difficult to make anything like a thorough exploration of the extensive region lying between the mountains that form the barrier to the almost unknown country of Yoro on the east and the highlands of Santa Barbara on the west, a tract corresponding to the common bottom lands of the Uloa and Chemilicon rivers. In the lower reaches of the Uloa I observed the same signs of buried relics attended by the same phenomena as in the localities where the excavations were made, but less frequently, and in diminishing quantity towards the mouth. Proceeding up the river beyond La Pimienta, I occasionally found objects similar to those taken from the excavations in the vicinity of Playa Muerto and Santana. These signs continued up even to where the river occupies a narrow gorge among the mountains. Wherever an old deposit occurred along the course of this stream, it was almost sure to contain fragments of pottery. Just below La Pimienta the Uloa receives the waters of another stream formed by the confluence of Rio Blanco—the outlet of Lake Yohoa—with the combined waters of the Sulaco and the Humuya. In each of these streams I found fragments of pottery sticking

in the banks, but only in the last named, which is the largest, were they at all noticeable, and even in that were not very numerous. The Humuya drains the plain of Comayagua in the interior of the country, but I did not attempt to follow its course so far. I followed for several miles the course of the Sulaco River, which drains the mountains to the east, but only near its confluence were the conditions favorable to the preservation of relics; for the rest of its course the stream occupies a rocky bed among the mountains. As for Rio Blanco, long before one reaches the lake, the stream becomes a mountain torrent. The Uloa may be navigated by a canoe as far up as Santa Barbara, a distance of some fifty miles above La Pimienta. In the Rio Blanco a canoe can proceed only a few miles, and cannot pass above the junction of the Sulaco and the Humuya, about fifteen miles above the mouth of the Rio Blanco.

There appeared to be a good many fish in the rivers, and I had plenty of hooks, but I could never get them to bite. This unskilfulness on the part of the fish may be attributed to the fact that they are not accustomed to be taken in that way. The Indian method of fishing is entirely different. We put it into successful practice, under Nicho's supervision, while we camped on one of the smaller streams. A certain vine called by the natives *barbasco* grows plentifully along these water-courses. It averages in thickness that of a man's thumb, and has a tough woody texture. When the Indian goes fishing, he selects a quantity of this vine, cuts it into suitable lengths, and pounds it with a club on any convenient stone that comes to the surface of the water. A yellowish sap is thus extracted, which mingles with the stream and kills every fish for a considerable distance along its course. A net stretched at some convenient point lower down collects them as they float along. As an article of food the fish does not seem to be injured in the least by the poison. I found them of a good quality and agreeable flavor. Nor is the water apparently made the less suitable for drinking by the infusion which proves so deadly to the fish. It would seem to be the peculiar property of the juice of the *barbasco* that it is poisonous to fish but harmless to other animals.

OBJECTS FROM THE EXCAVATIONS.

THE collection of objects found in the excavations includes a great variety of forms, and nearly all are of clay. These objects may be grouped as follows, in the order of numerical importance:—

1. Pottery vessels.
2. Terra cotta whistles or musical instruments.
3. Terra cotta figures and masks (hollow).
4. Terra cotta figures or statuettes (solid).
5. Terra cotta stamps or seals.
6. Stone vases and ornaments.



FIG. 8.—OBSID-
IAN FLAKE-
KNIFE. $\frac{2}{3}$.

Not included in these groups are a few fragments of obsidian, one fine obsidian flake knife five inches in length (Fig. 8), a small obsidian chisel, a green stone chisel (Fig. 9), two broken objects of stone (Fig. 10) such as are found throughout Central America and Mexico and supposed to have been attached to handles and used for beating bark cloth, one metatl, or rubbing stone with the hand piece, a conch shell prepared for blowing, a few perforated shells, and a number of objects made of clay, that are not easily classified or are of an uncertain character.



FIG. 9.—GREEN
STONE CELT. $\frac{2}{3}$

The first group, that of pottery vessels, is far the largest, although of the number represented comparatively few are entire. They embrace a great variety of forms, and represent a very considerable range of character, even tending to distinct and well-defined types. In artistic quality they range from the heavy coarse ware of common utility to decorative vases representing the highest development of the ceramic art of America. Nearly all of these finer articles are represented by fragments only. In a few cases a sufficient number of the pieces of a specimen were recovered to furnish the entire decorative design, but in the vast majority of cases only a small portion of the decoration is preserved. Not only these more delicate articles, but also the larger, heavier and coarser, were in most cases reduced to fragments. Most of the entire specimens belong to an intermediate and less interesting class, which by reason of their moderate size, their shape and strength, escaped with little injury through whatever vicissitudes they may have passed.

For convenience of description the pottery vessels, in so far as they are well enough represented to be classified, are here divided into five groups, designated by the first letters of the alphabet:—

A. Pottery of a high artistic quality, corresponding to varieties common to all regions subject to the influence of the ancient Maya civilization, and chiefly represented by specimens from Copan and Northern Guatemala. The

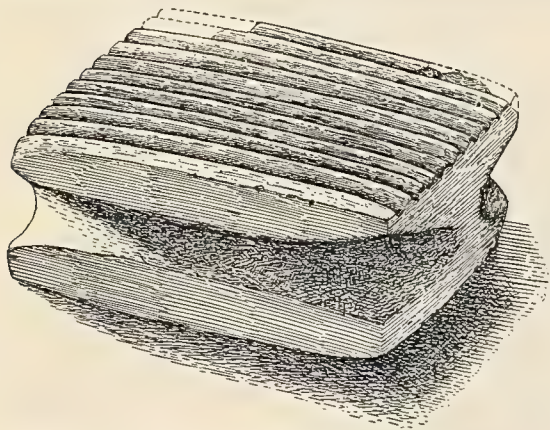


FIG. 10. — IMPLEMENT USED IN THE MANUFACTURE OF BARK CLOTH. $\frac{2}{3}$.



FIG. 11. — SMALL POTTERY VESSEL WITH DESIGN CAST ON OPPOSITE SIDES. $\frac{2}{3}$.

greater part of this pottery is decorated in colors, which in many instances retain their brilliancy. Other varieties have the decorative designs either incised or stamped on the surface. One specimen of the latter sort requires

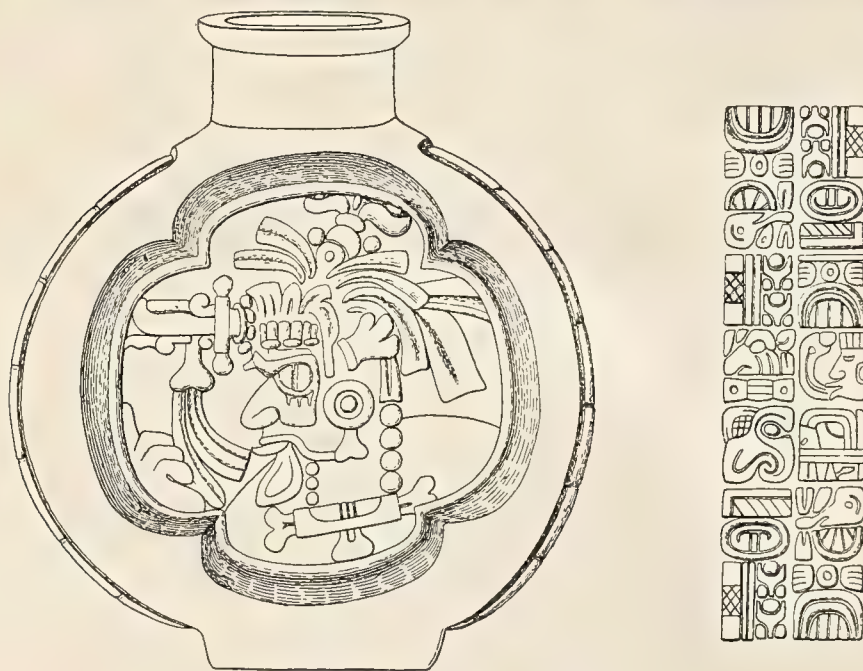


FIG. 12. — POTTERY VESSEL FROM GUATEMALA. $\frac{2}{3}$.

special mention, owing to its relations with specimens from other localities. It is part of a small flask-shaped vessel, made of a fine clay, light gray in color and unpainted (Fig. 11). On either of the flat sides is a design in

relief. The two sides are identical, and are apparently made from the same mould or moulds taken from the same original. The edges are plain. In Guatemala City I saw in private hands a similar specimen said to have come from the Alta Vera Paz region of Guatemala. The drawing (Fig. 12) is made from a cast of the original. The same figure adorns the two flat sides, and is the same as that on the specimen from the Uloa River. On each of the curved edges of this specimen is a double row of hieroglyphics, also in

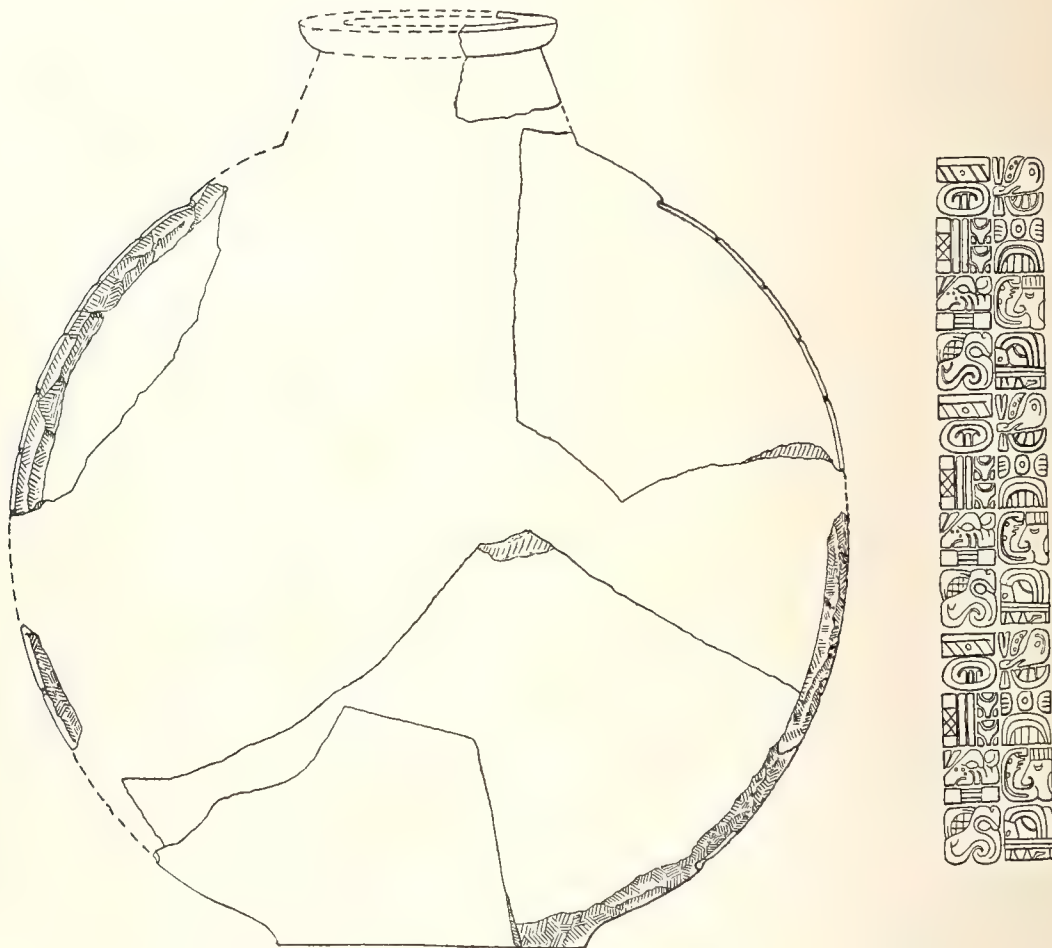


FIG. 13. — POTTERY VESSEL FROM COPAN. $\frac{2}{3}$.

relief and identical on both edges. The design on the two flat sides, as well as that on the two edges, must either have been made from the same mould or have been cast in moulds made from the same original. There are in the Peabody Museum fragments of another similar specimen from Copan. It is larger than either of the others, though scarcely thicker than the one just described. The flat sides are plain, while a hieroglyphic inscription in relief is repeated on either of the curved edges (Fig. 13). It will be seen

that the characters in the inscription are the same as those in the inscription on the specimen from Guatemala, but they are differently arranged. These three specimens are alike in the peculiar quality of the material, in color, in shape, and in finish, and would seem to have come originally from a common locality.

B. Pottery of a high artistic quality, closely resembling certain varieties belonging to group A, but possessing certain distinct and characteristic features, particularly a form of handles shaped like the head of some beast or bird.

C. Pottery distinct from other known varieties, and with group B constituting types that are apparently confined to the region here represented. The individual specimens of this group which are in general much larger than those of groups A and B, are decorated in colors, but less highly finished than the latter.



FIG. 14. — WHISTLE. $\frac{2}{3}$.

D. The specimens comprising this group are of an inferior grade to those of the foregoing groups, and but little decorated. They are characterized by a vertical spout, which appears to have been invariably equal in height to the mouth of the vessel. In most of the specimens shown this spout is broken off (Plate VII., *n*, *o*, *p*, *q*).

E. In this group are thrown a number of specimens, many of which are of a character common to every locality. Others, while bearing some resemblance to recognized types, are difficult to classify.

The whistles or musical instruments present a great variety of fanciful shapes. A common form consists of a hollow image of the human form or else a monkey, with an extension ending in a mouth-piece at the back. A very curious specimen represents a pair of twin monkeys joined together (Fig. 14). Another (Plate IX., *i*) represents a pair of frogs mating, and another (Plate IX., *j*) has the form of a large bullfrog. Each of the latter is a double whistle; that is to say, the air sent into it from the lungs divides into two currents corresponding to two separate cavities in the body of the frog.

This combination is so arranged that the double vibrations produced give a very excellent imitation of the trill of a bullfrog. Other specimens have the

forms of birds and various beasts. Most of the foregoing have two vents equal in size and equally distant from the mouth-piece. A different type has a simple opening for blowing and three vents (Plate IX., *o, p, q*). Another interesting specimen has the form of an animal of mythological character (Figs. 16, 17). It is unfortunately broken, which



FIG. 15. — PORTION OF WHISTLE, OF TERRA-COTTA. $\frac{1}{2}$.

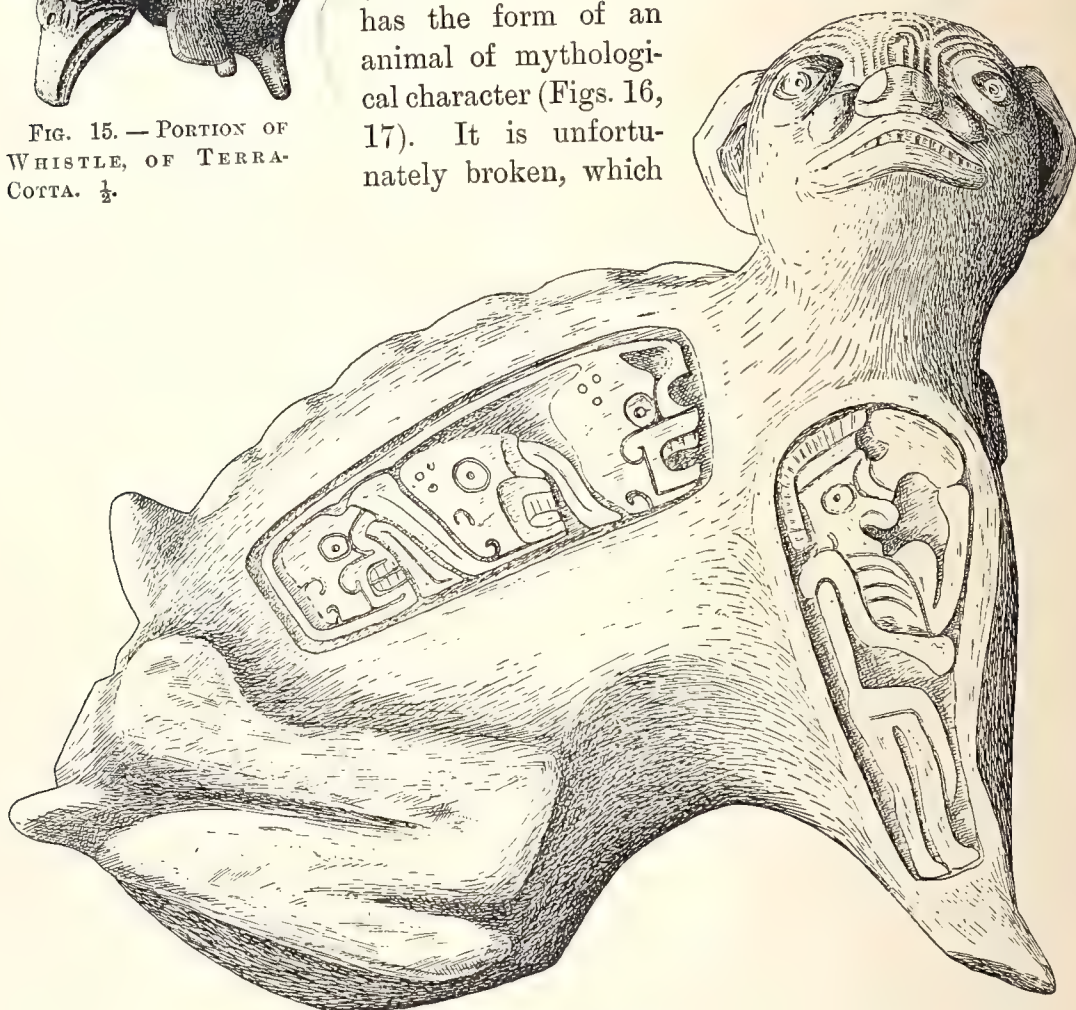


FIG. 16. — POTTERY WHISTLE, OR MUSICAL INSTRUMENT. $\frac{3}{4}$.

renders it incapable of being performed upon, but it would seem to have been an instrument of this character. The only opening is at the base of the animal's spine, and is about half an inch in diameter.

Besides these, which are entire, or sufficiently complete for their character to be obvious, there are a number of fragments which may have been parts of similar instruments. The highly embellished human mask (Fig. 18), the animal's head (Fig. 19), and *a, b, c, d, e, f, g, h, i*, on Plate VIII., are probably portions of whistles.

In the third class are a number of images, somewhat resembling in a general way specimens from Oaxaca. The best example of this form of object is that shown on Plate IX., *n*. It is about nine inches in height, and represents a nursing mother. The youngster, seated cross-legged on her knee, wears a headpiece, necklace and

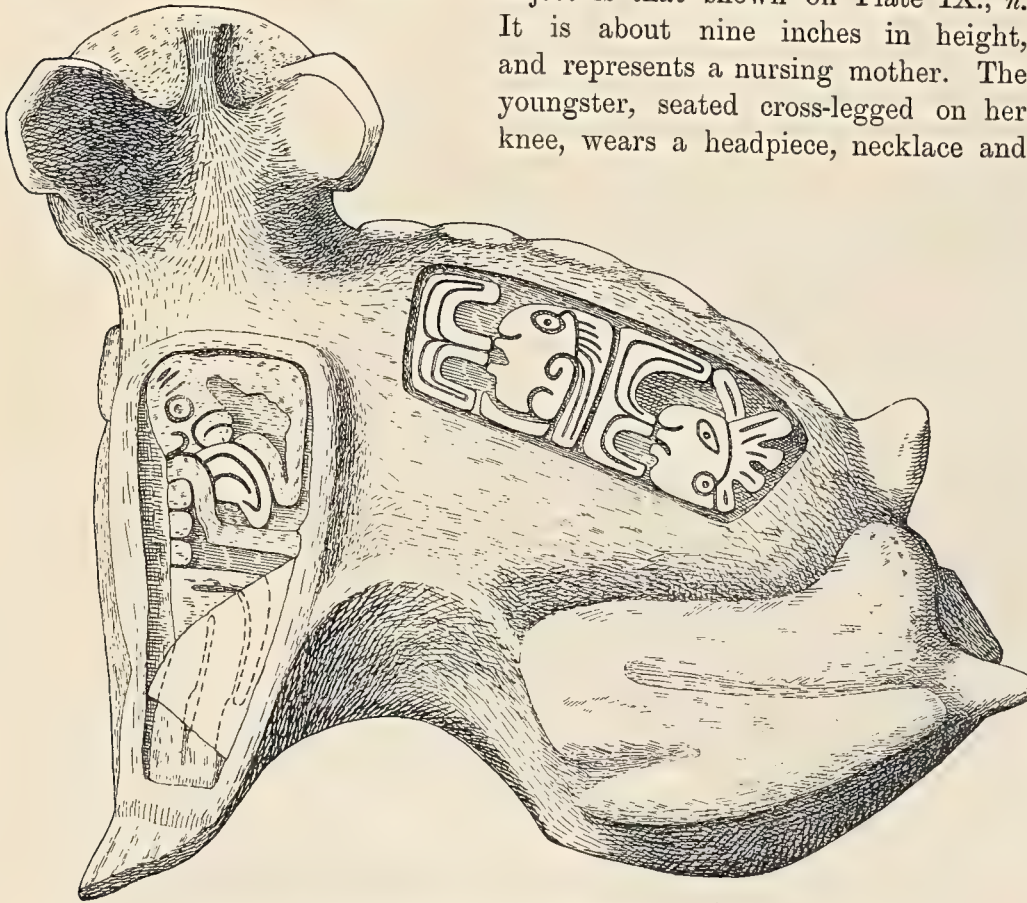


FIG. 17. — SAME OBJECT AS FIG. 16, OPPOSITE SIDE. $\frac{3}{4}$.

ear ornaments similar to those worn by the woman. The former wears also a girdle, and the latter a nose ornament and bracelets. The headdresses



FIG. 18. — TERRA-COTTA MASK, PROBABLY
PORTION OF WHISTLE. $\frac{3}{4}$.



FIG. 19. — PORTION OF WHISTLE. $\frac{3}{4}$.

are painted blue and yellow, and the necklaces and ear ornaments, blue; the remainder of the figures are a light red. The entire object consists of a moderately thin shell of baked clay, the interior being hollow. There is

a round opening about half an inch in diameter at the back of the head; the pupils of the eyes are represented by holes, and there is a pair of openings between the filed teeth. In Plate IX., *l* and *t*, are shown other examples of the same class of objects. In this class also is included a number of masks and similar objects, which, although resembling in material and workmanship those which embellish many of the whistles, do not appear to have belonged to any such articles (Plate VIII., *j* to *v*).

Three small masks of terra cotta (Plate XII., *a*, *b*, and *c*) have holes around the edges at the back, probably for fastening them to the dress, in the manner indicated by sculptures from Copan. They are of a very fine clay, very hard and polished, and may have been painted in such a way as to imitate carved stones.* All the objects included in classes two and three are cast. A few samples of the clay moulds used in their manufacture were found during the excavations.

Although many of these objects, and particularly the heads and masks,

are modelled with much artistic skill, none can be said to be faithful copies of natural objects. Evidently the artist, not being bound to imitate nature, had free scope for the exercise of his fancy; still he doubtless adhered to prescribed forms and followed conventional rules within certain limits, for these masks and heads, of which those shown in Figs. 18 and 19 are typical examples, are probably fanciful representations of mythological characters.

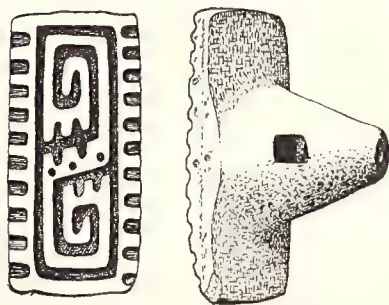


FIG. 20.—TERRA-COTTA STAMP AND WHISTLE.

Coming now to the fourth class of objects (Plate X.), we meet with a higher development of the artistic sense, and, in giving form and expression to certain conceptions, a much closer attention to nature as it is. A few specimens only were found, none being entire. The subject is the human figure, and the material is a fine light-colored clay. The modelling is fairly good. The figures are solid, well burnt, and very hard. The surface is polished, and in one case (*b*) there is evidence of a white enamel having been used. The female torso (Plate X., *g*) has a girdle about the waist; with this exception the figures are nude. They bear evidence of a very accurate perception of nature and a real ability to copy it correctly, indicating an artistic instinct that is capable of developing a high degree of realism.

Next in order is a number of clay seals or stamps (Plate XI.). They are flat plates of baked clay, having some conventional design in deep lines on one side and a short stub for a handle on the other. In some instances

* Mr. E. H. Thompson found in Yucatan clay beads on which remained traces of the green paint by which they had been made to look like jadeite. *Memoirs Peabody Museum*, No. 3.

this handle is enlarged and converted into a whistle (Fig. 20). One of these seals is cylindrical, and has a hole through the centre (Fig. 21).

On page 33, Fig. 34, is shown a pair of small receptacles of burnt clay; they are divided sometimes into two and sometimes into three compartments, and resemble crucibles; but it cannot be said definitely what their use really was. On Plate XII., d, is shown a double paint-holder, which still contains a quantity of bright red pigment. The clay pipe, shown on page 41, Fig. 35,



FIG. 21. — CYLINDRICAL STAMP. $\frac{2}{3}$.



FIG. 22. — OBJECT OF BAKED CLAY, PROBABLY EAR ORNAMENT. $\frac{2}{3}$.

is the only pipe from Honduras of which we have any record.* The curious little object shown in Fig. 22 is hard to describe. There is a twin specimen from Copan in the Museum, and I am of opinion that they are ear ornaments, and form another instance of imitation jewelry. The little projection at the smaller end would serve to keep the ornament in place. They are polished and very hard, and if painted might be made to look like stone. The nature of several clay objects, one of which is shown in Fig. 23, is not apparent; they resemble little marlin spikes more than anything else, but it is hard to see why such an instrument should be made of clay.

There remain to be mentioned only the objects carved from stone. Of these the most important are the two vases of calcite (Plate XII., e, f). Few specimens of this type have been reported. One figured in the *Journal de la Société des Américanistes de Paris*, Numéro 1, is reported to have been sent by a lady in Comayagua, Honduras, and to have been found in the river Humuya, which is a branch of the Uloa; but the exact locality is not stated. Another vessel of the same type is in the American Museum of Natural History in New York. It was in Squier's collection, and has been supposed to have come from Mexico, but without authority, as there is no reference to it in any of Squier's writings. In the absence of any reliable information concerning it, it ought to be referred to this Uloa region of Honduras, where similar specimens are known to have been found. A fifth specimen is in the possession of a resident of San Pedro Sula. It came from the same

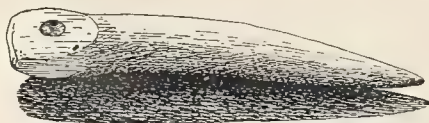


FIG. 23. — IMPLEMENT OF BAKED CLAY. $\frac{2}{3}$.

* This is the only pipe from Central America in the Museum, and the only one that has been found in that region, to my knowledge, except the remarkable stone pipe found by the late Mr. Sylvanus Miller in Salvador, and now in the Douglas collection in the American Museum of Natural History, New York.

locality as the two figured on Plate XII., while a sixth has been sent to the Berlin Museum. All these specimens differ but little from each other in respect of form and ornament. That shown on Plate XII., e, is provided with a rim about three-quarters of an inch deep on which the vessel rests; some of the others mentioned have similar rims ornamented with open work. They are carved from calcite of a translucent variety, and exhibit considerable



FIG. 24. — ORNAMENT
CARVED FROM CAL-
CITE. $\frac{2}{3}$.

elegant design which is in keeping with the beauty of the material. The walls are about one-eighth of an inch thick; the interiors are smooth and even, showing no tool marks. A grotesque head of conventional form projecting from either side serves for handles. A design of conventional pattern carved in low relief covers the outside surface, the chief device and leading feature of this decoration being a sort of grecque. The derivation of this form of ornament is uncertain and the notion unfamiliar, but the device

is associated without doubt with some set of ideas connected with the particular office which these vases were intended to fulfil. There are some indications that point to a feathered monster as the original form from which the various features are derived, the grecques resulting from the transformation of the feathers, through conventional treatment. Besides the specimens mentioned, there are a number of fragments which, although their evidence is meagre enough, lead to the conviction that the practice of this branch of art was not uncommon. Moreover they represent vases differing in shape and ornament and exhibiting a high degree of skill in the manipulation of stone in this particular form. An object carved from calcite and representing a death's head is shown in Fig. 24. The back is hollow, and each side is pierced as if for fastening the ornament to the dress.



FIG. 25. — DESIGN ON FRAGMENT OF TERRA COTTA FIGURE. $\frac{2}{3}$.

PAINTED DECORATIONS ON POTTERY.

AMONG the vases from the Uloa River, those forming groups A and B exhibit the most elaborate color decorations. The colors used are black, yellow, red and white; although their composition is not known, they are unquestionably of mineral character and generally retain their brilliancy. The quality of the paste employed in these two groups is the same; it is made of a light red clay of a fine grade, and the ware is well burnt and very hard. Usually, before the colors were laid on, the vessel was treated with a thin orange or cream colored slip, and on this ground the various designs were drawn, and then before firing the surface was polished with a smooth stone or other implement, of which the marks are still visible in a number of instances. There is no uniformity in the relation of colors in the design to those of the slip; a light red or yellow wash seems to have been a favorite ground for the color decorations.

The conventional forms employed in the decorations on group A are more or less familiar to students of the Maya codices. In one part of the group, that which is made up of the bowl and cup forms, the decoration is arranged in bands and zones of varying width, encircling the vase from top to bottom. The designs here reproduced, illustrating these forms, are transferred to flat surfaces without breaking up the relations and with only such slight and inconsequent distortion as results from the changed form of the available space. Geometrical figures, *i. e.*, straight lines and circles, are drawn mechanically instead of in the bold freehand of the original; otherwise no departure is made from the character of the original drawing. With each design is given a sketch of the corresponding vase (Figs. 26 to 30 inclusive and *a*, Plate III.). In these drawings black represents black, red is represented by line shading, and the yellow or orange ground is left white. The design shown on Plate IV. is painted on a vase nine inches high and seven inches in diameter. The entire surface of the vase, which is made of a fine red clay, was covered before firing with a cream-colored slip, and the design drawn boldly on this in black and different shades of red. The space between the figures was then painted black. There is no sign that care was taken in the drawing. The decorator evidently worked rapidly and even carelessly. The drawing of the life figures is extremely crude,—a fact which is best seen in the treatment of the right hand of the personage holding a band or piece of ribbon, which the painter has made to look like a fork with three prongs. Around the rim of the vase is an ornament in the form of a kind of grecque, drawn in black. Below

this come a narrow red band and a black band of the same width. A white or cream-colored band divides this upper portion of the design from the main motive. From the narrow black band are suspended twelve

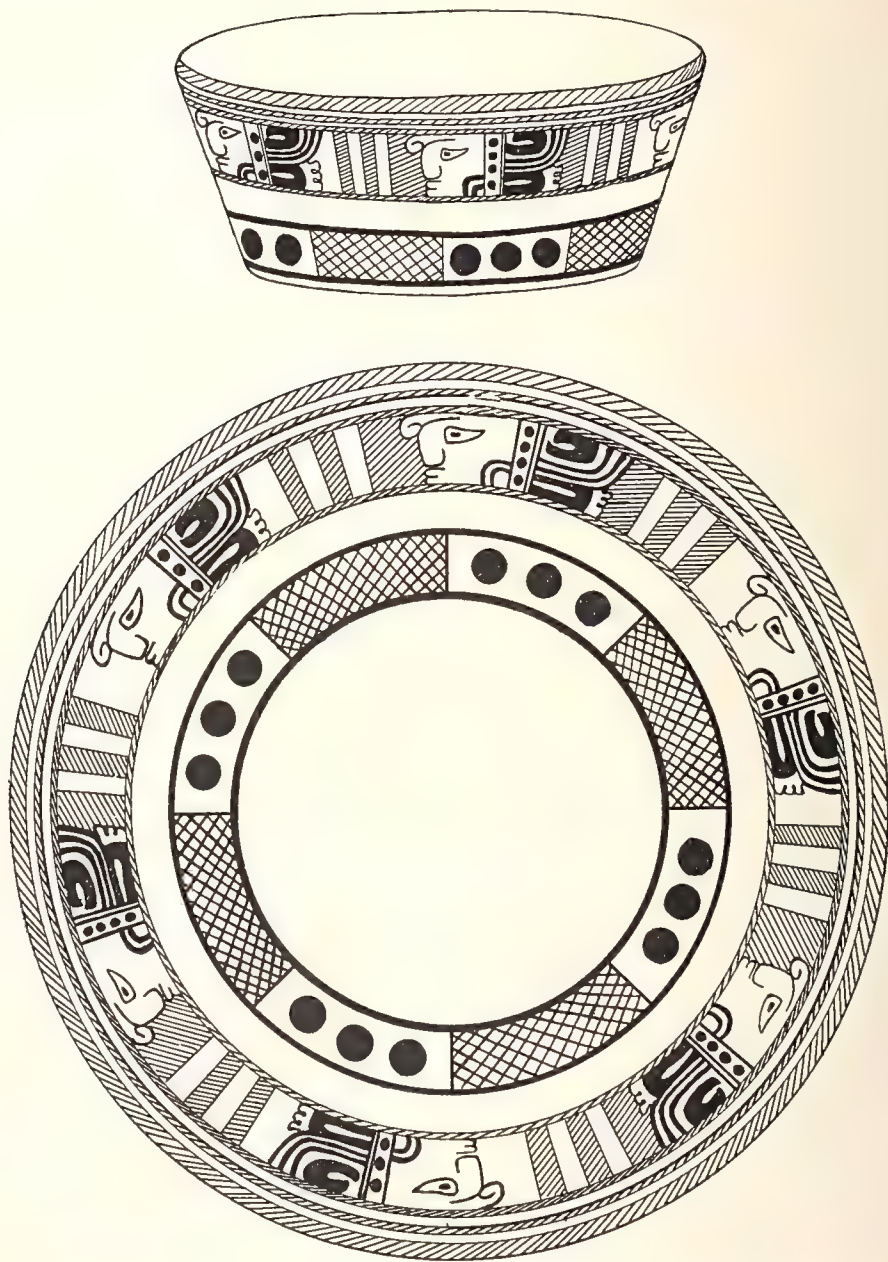


FIG. 26. — DESIGN PAINTED ON VASE. $\frac{2}{3}$.

objects, all alike and divided into groups of four by three looped devices depending from the same line. Each of these twelve objects is made up of four parts, — a shield; a cord (represented by the conventional cord symbol *kaam*) by which the shield is suspended; a device upon the shield corre-

sponding to the sign for *Lamat*, one of the days of the Maya month; and a wing attached to the bottom of the shield. The lower part of the design consists of a group made up of the plumed serpent and a personage repre-



FIG. 27. — DESIGN PAINTED ON VASE. $\frac{1}{2}$.

senting some divinity. The serpent's body is bent in the form of an arch, under which are placed two square crosses. This group is repeated once. On Plate V. is shown the design on another vase similar to that just described. The two designs are of much the same order. All the outer

surface of the vase is covered with a rich, cream-colored slip. In the upper part of the design the space between the outlines of the figures is covered with a black paint, and the additional features of the figures are added in red. As in the former instance, the objects forming the chief feature of this part of the design are suspended from a black band followed by a white line. In this case there are fifteen suspended shields divided into groups of five by the looped figures. The shield with its device, which resembles an escutcheon charged with a bend sinister between two annulets,

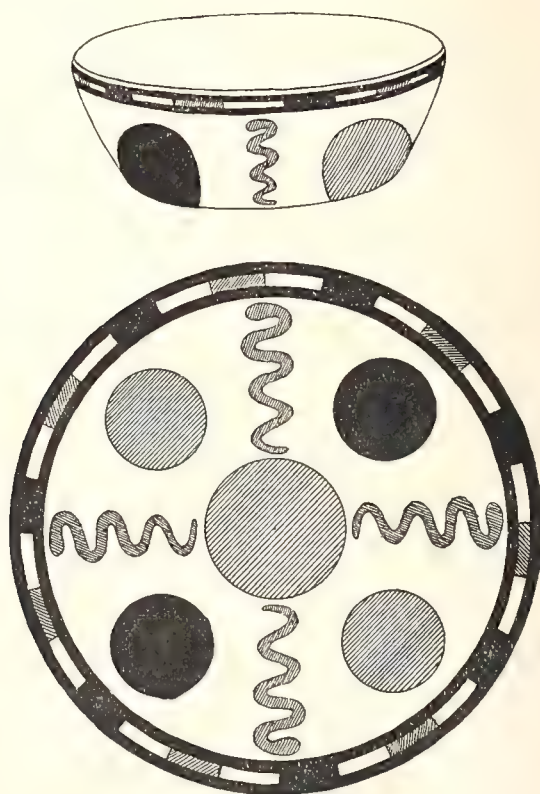


FIG. 28. — DESIGN PAINTED ON BOWL. $\frac{1}{2}$.

is not in this case among the familiar symbols of Maya chronology. The lower part of the design, which represents a procession of three figures each holding a sun shield, is drawn in black and various shades of red upon the cream-colored surface.

Group B is less satisfactorily represented than group A, owing to the fragmentary character of the specimens, and no entire design can be made out. Among the figures employed, however, many can be recognized as derivations from Maya symbolism but exhibiting certain peculiarities in the manner of treatment. The vases of this group are further differentiated from those of group A by the introduction of new conventionalisms, the principal innovation being the handles representing animal features — the

head of a bird or beast — with which the vases of this group seem invariably to have been provided. This feature is seen on the specimens illustrated on Plate I. Figs. 10, 12.

The red porous ware comprising group C differs from all known varieties in the character of its decoration as well as in form and workman-

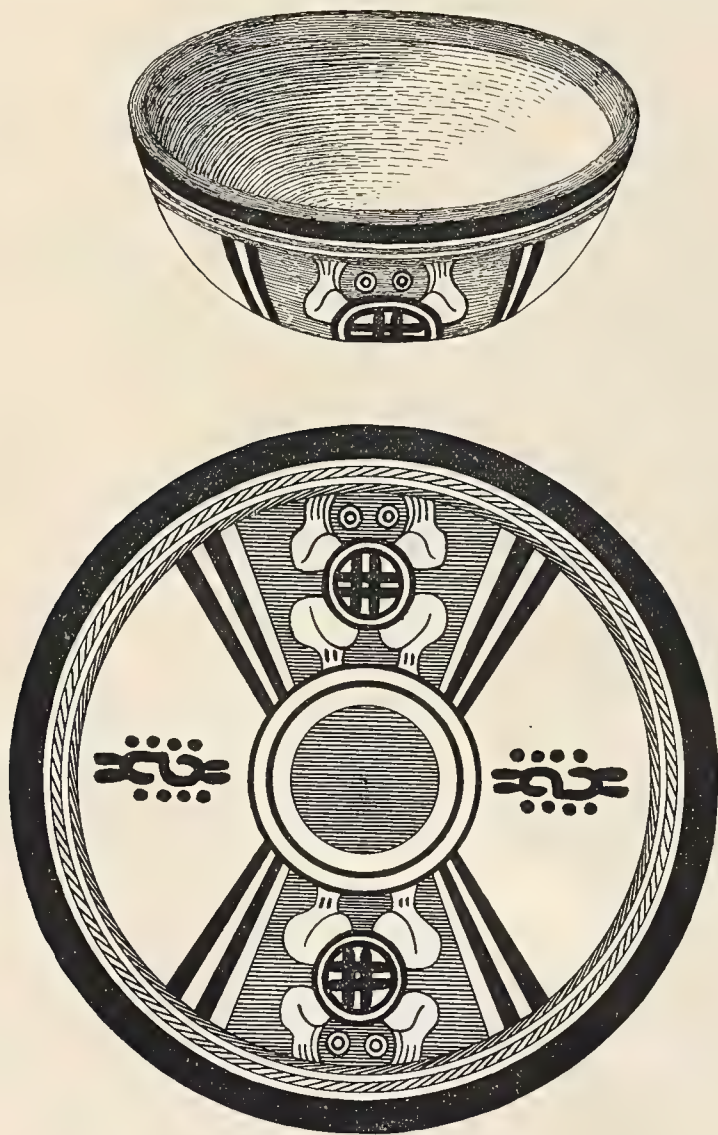


FIG. 29. — DESIGN PAINTED ON BOWL. $\frac{2}{3}$.

ship. The paste, while similar in character, was subjected to a temperature lower than that employed in the firing of the foregoing groups. Although complete specimens that would furnish accurate information respecting shape and size are wanting, the vessels appear to have been unusually large; the middle circumference being in each case the largest. The decorator

seems to have employed only red and black in his color delineations. The whole surface of the vessel was first treated with a light red slip and

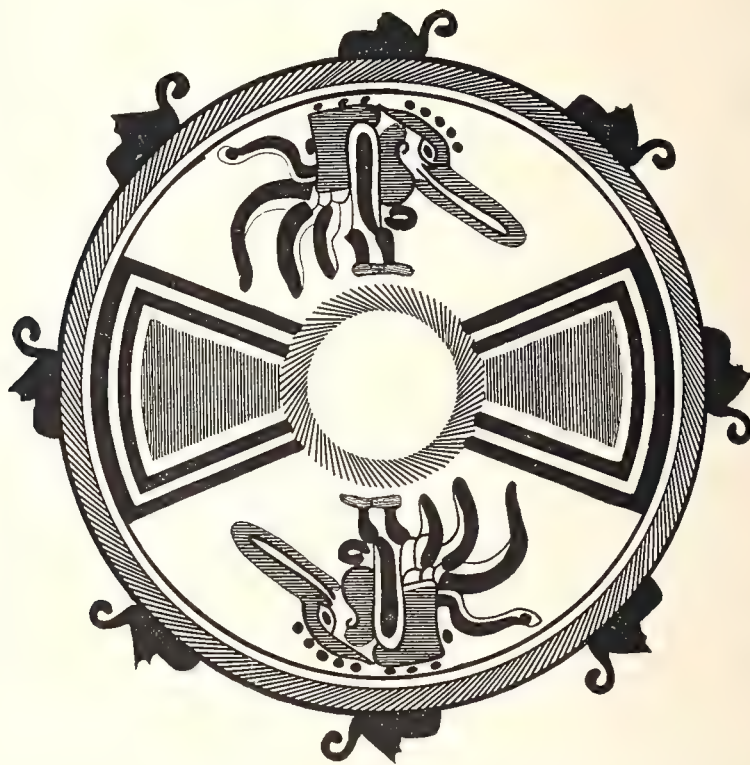


FIG. 30. — DESIGN PAINTED ON A BOWL SIMILAR TO THAT SHOWN IN FIG. 29.

the design drawn upon this in black or in dark red. The surface of the pottery is without polish, and is less highly finished than groups A and B.

A figure drawn in black on a fragment of one of these vases is shown on Plate III., *b*.



FIG. 31. — DESIGN PAINTED ON FRAGMENT OF POTTERY VESSEL. $\frac{2}{3}$.

The animal shown in Fig. 31 is taken from a fragment of a vessel, the remainder of the design being entirely lost. The figure is painted in red on a yellow ground.

Fig. 32 represents the decoration on the rim of a vessel of which nothing else remains. A band, an inch and a half in width, was marked

out on the surface before firing; a row of glyphs was drawn upon this band, and the intervening spaces were cut out with a sharp instrument, leaving the glyphs standing in relief. Above each glyph another symbol is painted in red. The remainder of the surface is painted white.

There are fragments of several vases, belonging probably to group B, which had in each case a projecting and slightly flaring rim, around the bottom, on which the vessel stood. The common form of decoration on



FIG. 32. — DESIGN INCISED AND PAINTED ON RIM OF JAR. $\frac{1}{4}$.

these rims is illustrated in Fig. 33. The central portion of each of the terraced figures in this design is sunken, the clay having been cut out over this space, before firing, to a depth amounting to less than one quarter the thickness of the rim. The rim is also pierced at a point about the centre of this space. It seems probable that the space was inlaid with a piece of some material cut to the same figure and fastened by means of a rivet or dowel.

Vegetal forms, easily recognized as such, are rare in the decorations of pottery of all classes. On Plate I. Fig. 7, is shown a fragment in which



FIG. 33. — DESIGN ON RIM AROUND THE BOTTOM OF A JAR. $\frac{1}{4}$.

a vine, forming the chief motive, is treated quite naturally. Animal forms and their derivations are conspicuous even in some of the most conventional devices, and geometrical figures and patterns constructed independently of natural forms and not in imitation of natural objects make up a large part of the painted decorations.

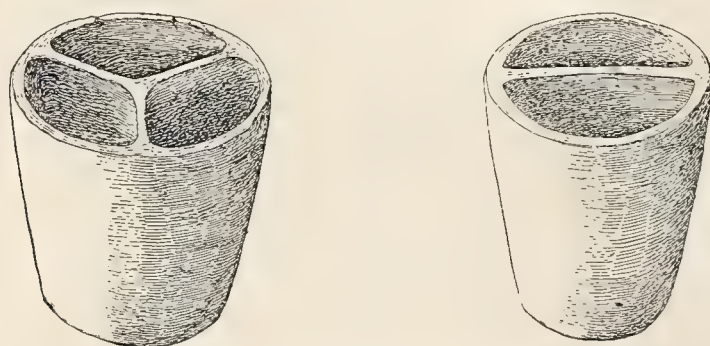


FIG. 34. — CRUCIBLE-LIKE OBJECTS OF CLAY. $\frac{2}{3}$.

SUMMARY AND CONCLUSION.

THE questions relating to the origin of the remains in the Uloa valley and the manner of their occurrence are rather perplexing. While the region under consideration properly includes the entire plain watered by the two converging streams and having an area of less than one thousand square miles, our discussion is practically restricted to a strip comparatively narrow, though of indefinite width, extending along both sides of the Uloa. The specimens that have been described are from the immediate banks of this stream; and while, as has been said, similar objects occur in other parts, this occurrence is, so far as numbers go, not to be compared with the conditions experienced in the more restricted territory; nor does it seem that the more artistic objects of pottery have been found except in the terraces of the Uloa, although jadeite beads and carved pendants, whistles and pottery of the less ornate varieties, have been found in the most remote parts of the region.*

* There are some historical references among the early writers from which one would infer that at the time of the earliest colonization this region was thickly inhabited by Indians, whose chief town, called Naco, was destroyed as early as 1524. The Bishop Las Casas says that between the years 1524-35 there perished in the realm of Naco and Honduras more than two million Indians through the cruelty of the Spaniards, and there did not remain more than two thousand natives in a territory of one hundred square leagues.† It is probable that Las Casas did not have a very definite notion of the extension or character of the country which he vaguely describes as the realm of Naco and Honduras. Bernal Diaz, whose testimony as an eyewitness is of greater value, is unfortunately not explicit in his descriptions.

In 1523 Cortez, having heard false reports of the native wealth of the Honduras or Hibueras, as that part of the Central American mainland is vaguely called in the earliest writings, sent out an expedition from Mexico under command of Cristobal de Oli to found a colony there. Sailing from Vera Cruz, Oli arrived on the north coast and founded a town which he called Triunfo de la Cruz, somewhere near the mouth of the Uloa River. He also conducted an expedition into the interior, against an Indian stronghold called Naco, "a large township," says Bernal Diaz, "which lay in a populous district. It was at this time that Naco was completely destroyed and the whole of the surrounding country laid waste." About the same time reports reached Cortez that Oli had conceived a plan for proclaiming his independence and making himself governor of the new territory; he accordingly sent Francisco de Las Casas to bring back his rebellious officer. Arriving off the site of the new town just founded by Oli, Las Casas lost his ships with all his equipment in a storm, and, being driven ashore in boats, he was taken prisoner, and all his men taken into service by Oli. A short time before this an expedition from Hispaniola, commanded by Gil Gonzales de Avila, had landed on the coast near the mouth of the Rio Dulce and founded a town called San Gil de Buena Vista. Oli, jealous of Avila's influence so near the sphere of his own, sent an expedition against him and made him a prisoner. Thus Oli had two enemies in his power, who, regaining their liberty, plotted his overthrow and forced him to take refuge in the woods, where he was soon caught, and executed in the market-place at Naco. Las Casas and Avila then started back to Mexico by sea.

† "Il est constant que depuis l'année 1524 jusqu'en 1535 il a péri plus de deux millions d'Indiens dans le royaume de Naco y Honduras, et qu'il n'y est resté que deux mille habitants sur une étendue de territoire de cent lieues carrés." Œuvres de Las Casas, Tome Premier. Edited by J. A. Llorente, Paris, 1822.

Again, no investigations have been made to show whether the remains lie as deep in the parts more remote from the river, or whether they are confined

Cortez in the meantime having heard nothing from Las Casas for eight months after the latter's departure from Mexico, and fearing that some mishap had befallen him, set out with a band of his veteran conquistadores and an army of Mexicans to march by land to the country which he knew as the Honduras. After suffering great hardships he reached the coast at Golfo Dulce, where, after crossing the river which flows into that arm of the sea, he came upon the remnant of Avila's colony of San Gil de Buena Vista, of which the Indians had informed him. Here he learned of the execution of Oli. After making a voyage in a brigantine belonging to the little colony, up the Rio Dulce, during which he discovered Lake Yzabal or Lago Dulce and explored the river Polochic, where he fought a battle with the inhabitants of an Indian township, he set sail to explore the coast to the eastward. Choosing the best harbor that is afforded on all the coast, he named it Puerto Caballos, the same that is now called Puerto Cortez, and founded a town which he named Natividad. At the same time Sandoval, his second in command, marched from Rio Dulce to Naco. Bernal Diaz was among those of the veterans who marched with Sandoval, and he thus alludes to their arrival: "We came to Quinistan and on the following day in the forenoon we arrived at Naco, which at that time was a township of considerable magnitude, but there was not a single inhabitant to be seen, and we quartered ourselves in a large courtyard where Cristobal de Oli was beheaded. In some houses we were fortunate enough to find a good supply of maize, beans, and even some salt, of which latter we stood in great want. In this place we quartered ourselves as comfortably as if we never meant to leave the spot again."

He goes on to say that they lived on friendly terms with the Indians in the neighborhood of Naco. Sandoval had a conference with several of the Caziques, in which they agreed to supply him regularly with provisions. Afterwards he visited several other townships, all of which submitted without resistance, and in time the people of Naco regained confidence and returned to their houses.

At a few leagues from San Pedro Sula there are to be seen to-day the ruins of an Indian township, and on the same site are traces of Spanish occupation in the outlines of the foundations of houses. This place is still called Naco: it corresponds very well with the place of that name mentioned by Diaz as quoted above, and there is every reason to believe that the two are the same. The site contains one of the most extensive groups of earthworks in the whole region. They are completely buried in the jungle and are much disfigured, but they appear to have been of the same character as those discovered east of the Uloa River, which have been described.

Cortez, after founding Truxillo farther along the coast, returned to Mexico by sea, while those of his companions who did not embark with him, under command of Luis Mariu, marched from Naco towards the town of Guatemala, then recently founded by Alvarado. On the way thither, they met Alvarado, coming towards the coast in the hope of finding Cortez, and all returned to Mexico by way of Guatemala. In this journey, Luis Marin, in whose company was Bernal Diaz, who recounts their adventures, must have passed near the ruins of Copan.

After the departure of Cortez and his companions from Honduras, the colonies which he had founded were soon strengthened by fresh arrivals from Cuba and from Spain. The interior of the country was explored, rich gold mines were discovered, and soon one of the chief lines of communication between Central America and the outside world lay through the Gulf of Honduras and the country bordering on it. Over this route the product of some of the richest gold mines in New Spain was transported to the north coast, from which the treasure ships put out to sea. Consequently these waters and this part of the mainland early became a favorite hunting-ground for the buccaneers and gentlemen in the service of Elizabeth; for the protection of the coast, the fortress of Omoa, for a long time the strongest in the New World, was built.

The condition of the native population during these times was of course one of abject slavery. They were driven in swarms to the mines, where they perished by thousands under the cruel treatment of their masters, so that the statement of wholesale depopulation reported by Las Casas is not incredible.

From the account given by Bernal Diaz one would infer that the country watered by the Uloa and Chemillican rivers and their tributaries was at the time of its discovery supporting a large industrial population. The adventurers found extensive maize plantations, and they were supplied with provisions in abundance. The people were assembled in towns, some of which would seem to have been of considerable extent. Of these Naco was without doubt the most important, and was large

to more superficial strata than is the case along the Uloa. The immediate problem consists, first, in finding an explanation of the various phenomena attending the occurrence of relics in the ground covered by the explorations, and, second, in the interpretation of the historical significance of the relics themselves in their relations to remains from other parts of the country. The object sought in the first of these inquiries is a knowledge of the original location and former condition of the relics, the manner of their present distribution, and the agencies responsible for the changes they have undergone. It has been seen that these objects are found associated with the alluvial beds in a more or less stratified manner to a depth of thirty feet or more. The first explanation that is suggested by the manner of their distribution together with the facts which point to the shifting action of the river consequent upon sudden increase of volume, is that the objects were transported by the current together with the clay, sand, and gravel, and laid down simultaneously with these at successive periods. If this were the case, we should expect the objects to show water-wearing, which they do not. The deposits being laid down by the river at present on its shallow side (see Figs. 1 and 2), contain objects transported from the opposite side, and all these objects show extensive water-wearing; the corners are rounded off, and the colors of painted specimens are destroyed by the combined action of the sand and water in the same way that pebbles are rounded and worn smooth. Those taken from the excavations described in the first part of this report, on the contrary, show in no instance the least indication of the wearing action inseparable from alluvial transportation. The broken edges are sharp, having often the appearance of fresh breaks, and the colored and polished surfaces are unscratched. It follows therefore that the interring must have been accomplished without the agency of the river. In short, the objects must have been put underground in the customary way in connection with burials, but not to the depth at which they are found at present. These burials must have been made during successive periods of occupation, separated by a series of inundations each of which raised the general level of the

enough to be described by Bernal Diaz, who was accustomed to large Indian cities, as "a township of considerable magnitude." The historian mentions "houses," but says nothing of their construction. They must have been of some pretensions, however, since it was possible for Sandoval and his companions to quarter themselves "as comfortably as if we never intended to leave the spot again." The inhabitants were peaceable, and would doubtless have received Sandoval in a friendly manner had not the outrages of Oli already given them reason to look upon the Spaniards with fear and distrust.

Whatever the condition of these people may have been at the time of their first contact with Europeans, they quickly disappeared under Spanish oppression; and to-day the only pure-blooded Indians to be found on the banks of the Uloa River are wild Xicaques who have wandered down from the mountains of Yoro, where that tribe remained in comparative security and isolation through the period of Spanish rule. The people whom the Spaniards found in the valley of the Uloa and the adjoining region must have constructed the earthworks and other objects whose remains are found upon the surface to-day, and these earthworks mark the sites of their towns, all of which were destroyed by the earliest colonists.

ground several feet by the deposition of detritus from the mountains. Each of these catastrophes would be followed by a rapid growth of vegetation, and the population would return to the neighborhood of the river, that was their source of life, where they may have remained undisturbed for many generations. Sometimes the site of the later burying-place was directly over that of the old, either by design or accident, and thus we have in places a succession of layers, representing the burials that correspond to separate periods. More generally, however, the new site chosen was different from the old; and consequently in certain localities remains are found in one layer only, which may be at any depth, from the level of the water to within five or six feet from the surface. The excavations that have been described were made at points where the number of layers containing relics was greatest according to observations on the face of the bank. The burials were made without any form of tomb, the body together with the associated objects being simply deposited in the ground and covered with earth. The finding of different pieces of the same vessel separated by several feet, suggests that the vessels were sometimes broken before the interment was made, while most of those that were buried entire were subsequently crushed by the weight of the superimposed strata, which increased in thickness at every inundation. Perhaps the most puzzling circumstance is that so many of the objects are represented by portions only, isolated fragments of all sizes being continually encountered in the excavations. Moreover it was not possible to define individual burials or distinguish the corresponding sets of associated objects; there was a certain promiscuity in the manner of their distribution that seems to indicate that the same ground was utilized repeatedly, and that the earlier interments in any particular burying-place were disturbed and their arrangement broken up by those which came later. It is probable also that many of the isolated fragments which are found distributed through the strata were accidentally buried. The distribution of potsherds in the form of refuse through the surface soil is a necessary outcome of continued occupation by communities in which the product of the potter's art was extensively used. Again, if these communities were temporarily obliterated by flood, as has been argued, such objects of stone and pottery as were in use at the time of the catastrophe may have been covered up without the transportation of which they would have retained evidence. The combination of circumstances here detailed seems to furnish the only solution of the problem that is at all satisfactory.

The human remains, although of the most meagre description, when taken in connection with the pottery with which they were found associated, confirm the existence of burials. They consist of crumbling fragments of bone occurring in the same strata with the objects of pottery; and while they furnish reasonable evidence of burial-places, they are too minute to supply any information respecting the form of the burials or the relative

position of the objects associated with them. The data obtained give only a very general idea of the mode of sepulture practised in this region. The objects and utensils were probably placed beside the dead or thrown in the grave as it was being filled up. The fact that no tomb was built and no stones were placed about the body, shows that the people were less careful of the preservation of the dead than most of the peoples of Central America. The almost total disappearance of the skeletons is not more than is to be expected in a region of excessive moisture and in the absence of protection. Even in the well-built graves of Chiriqui, according to various testimonies, human remains are almost entirely absent. The cemeteries were probably located in the vicinity of towns or villages, but absolutely no trace of dwellings was discovered. The houses were constructed of perishable material, such as wood or adobes.

The second inquiry has reference to the historical significance of the art relics. There is no evidence here of different periods of culture or separate epochs marked by advancement of the arts or by radical changes of any description. What we find is evidence pointing to an extended period of constant culture during which certain arts which flourished in this region manifest a development equal to that attained by the highest civilizations of Central America. There is no evidence of the use of metals, and architectural remains are entirely wanting. So far as we are able to judge from their remains, it is in the potter's art—the manipulation of clay—that the people of this region excelled, and it was this art that was most assiduously cultivated. In drawing any such conclusion as this, however, it must be borne in mind that the class of objects dealt with has the advantage of outlasting all the other products of human skill. What degree of perfection was possessed in the manufacture of textile fabrics we have no means of knowing. In certain forms of stone-cutting, the traces, although meagre, show considerable proficiency, while in the matter of color decorations there is abundant evidence of a skill equal to that attained by the people of any of the neighboring provinces. The great body of art relics are in clay: and while in some respects they are closely related to the art of neighboring provinces, in other respects they possess a distinct individuality. It is surprising to find in a region of such small extent such a variety of forms and types as is exhibited by these relics from the Uloa valley. The vases alone represent a wide range both in form and in decorative motives. This great variety of character looks towards an admixture of races, or at least a diversity of external influence; but whatever combination of minor elements may have entered into the composition of society in this region, or whatever external agencies may have contributed to the production of the objects in question as representing its art and industry, it is evident that the dominating influence was Maya. If not a branch of the Mayas, the people, with whose remains on the Uloa River we

are now brought in contact, were in close relations with some portion of that race, whose customs they adopted and by whose culture they were enriched. They were, in fact, subject to the Maya civilization, and the surviving products of their art and industry pertain largely to that civilization. The absence of architectural remains, the most familiar and remarkable feature of Maya culture in other regions, does not of necessity militate against the proposition just put forward, for in any given region the presence of suitable material in an accessible form is a necessary condition to the development of sculpture or the production of enduring monuments of architecture such as are found at Copan and in the ruined cities of Yucatan and Chiapas. But for the proximity of trachyte beds furnishing a convenient workable material, the elaborate architecture of Copan could never have been developed. In the valley of the Uloa there is no available supply of stone that could be manipulated in accordance with the requirements of an architecture like that of Copan, by a people with no better tools than flint chisels. Whatever the inhabitants of the region may have accomplished in the art of building, the material used was less durable than stone, and probably consisted of adobe and wood.

Art in clay, which in the ancient centres of Maya culture occupies a subordinate position, in this region takes the place of art in stone almost entirely, and accordingly the former is given a wider application than elsewhere. Although here, as elsewhere, the vessel represents the first idea and the leading feature of ceramic art, images, musical instruments, seals, and articles of personal adornment occupy a very important place, and there is a conspicuous ambition to model life forms—natural or mythological—apart from objects of utility. The attempt to model the human form is worthy of especial mention, and is more meritorious than any similar attempt of which traces have survived in the neighboring provinces.

It is among the pottery vessels that the Maya affinities are most prominent. Of the number represented, either by entire specimens or by fragments, not only do the greater part exhibit technical qualities identical with the pottery from Copan, but especially in the conventional use of certain decorative motives and in the employment of a graphic system common to that of the codices and to the sculptured monuments of Maya, these affinities are very manifest. The same relationship makes itself felt, although in a less striking manner, in the other classes of objects. It is not claimed that this relationship, however intimate, covers the whole ground, or that there is any homogeneity throughout the whole body of ceramic products, as if it were the work of a homogeneous people and represented a culture developed from within. On the contrary, there is in the tendency toward diversity of type strong evidence of an admixture of races, or of extensive importations derived from a variety of sources; but the incomplete character of the available data would make an analysis

of these mixed conditions very difficult. The affinity already spoken of is the only one that is definite and obvious. The whistles and musical instruments, while they resemble in some respects similar instruments from the graves of Chiriqui, show a much greater perfection of form and ornament, and possess a strong individuality. While to a superficial observer none of these instruments are more than whistles or mere toys, an examination shows that many of them possess powers which give them a more pretentious character. Very simple in construction, they answer within certain limits to the requirements of real musical instruments, and although the mutilated condition of these instruments prevents a satisfactory determination of their actual capacity, they serve to show that music in a crude form was cultivated among the people to whom they pertain. There is no proof of the existence of any fixed scale of intervals, but the condition of the instruments makes it impossible to speak with certainty on this point. While all these instruments are limited in musical capacity, those of the more pretentious class, if operated by skilled performers, are capable of producing pleasing melodies. Moreover there is among them a certain correspondence in construction, in the number of tones, and in the succession of intervals that indicates a tendency to conform to more or less definite standards. In the hands of modern musicians these instruments, played in unison, can be made to produce harmony, but it would be rash to say that their owners had any knowledge of this, or that they made any systematic use of their limited musical capacity. The mechanism most commonly employed is that of the modern flageolet, as shown in Fig. 20. While some of these are simple whistles, giving one or two notes only, the great majority are provided with two holes equally distant from the mouthpiece; these holes are always exactly equal in size and consequently give the same note. Three notes is the full capacity of these instruments, one with both stops closed, another with either one open, and a third with both open. In the most pretentious class the mechanism by which the sound is produced is a plain opening or passage communicating with the air-chamber, which is provided with three stops capable of producing five distinct tones. Two of these stops are always placed at equal distances from the mouthpiece, and being equal in size, when either one is alone open, the same note is produced. Plate IX., *o*, *p*, *q*, are good examples of this type.

The stamps or seals resemble very closely the well-known Mexican article, and still more closely specimens from Venezuela.

Obvious and striking as are some of the extraneous relationships, and particularly that which connects the art and culture of this region with that which distinguishes the people of the great Maya stock, not less remarkable are the traits that distinguish a considerable portion of the art relics of this region from those of all other localities and give a marked individuality to certain groups of objects. The stone vases, represented by fugitive

specimens and constituting almost the only evidence of art in stone, form a unique and interesting group, with marked individual characteristics; and the same is true of a considerable portion of the ceramic products. It is singular that tools of all sorts are almost absent, and implements of war entirely so.

With regard to the surface remains in the Uloa valley, it can only be said that they appear to have no distinct connection with the underground relics. The few objects of art that have been observed among these earth-works bear no apparent relation to the deeper and therefore older material. The carving of the one idol that came under observation is extremely crude, and has more resemblance to Nicaraguan sculptures than those of any other section with which we are familiar. Although there is no definite testimony as to age, these surface remains probably belong to the period corresponding to the earliest Spanish colonization; and whatever the origin of the people to whom they are to be attributed, they did not possess the degree of culture that distinguished their predecessors in the same region.



FIG. 35. — TOBACCO PIPE OF CLAY. $\frac{2}{3}$.

LIST OF PLATES.

PLATE I.

Samples of fragments of painted pottery illustrating groups A and B. Nos. 4, 7, 10, 11, 12, 15, 16 present characteristics which belong to group B; the others seem to represent vases belonging to group A. Objects on the plate are reduced $\frac{1}{2}$.
From excavations on the banks of the Uloa.

PLATE II.

Map of the lower watersheds of the Uloa and Chemilicon Rivers. The sites of the excavations mentioned in this report are indicated by the figures 1, 2, 3, and 4 enclosed in circles.

PLATE III.

a. Design painted on vase, three colors.
b. Design on a fragment of a large vase, two colors.
From excavations on the banks of the Uloa.

PLATE IV.

Decoration on the surface of a vase, group A. Design in three colors.
From excavation on the banks of the Uloa.

PLATE V.

Decoration on the surface of a vase, group A. Design in three colors.
From excavation on the banks of the Uloa.

PLATE VI.

FIG. 1. View on the Uloa River showing site of Excavation 3, looking down stream.
FIG. 2. Bank of the Uloa River at the site of Excavation 4. Excavation begun.

PLATE VII.

Pottery vessels from the banks of the Uloa River, showing variety of forms.

- a* and *b*. Opposite sides of the same vessel; it is painted red.
 - c*. Dark gray ware, human features.
 - d*. Nicaragua type, light red slip.
 - e*. Light red slip.
 - f*. Body and top of neck painted red. Incised decorations on neck.
 - g*. Dark gray ware, plain surface.
 - h*. Dark brown ware, surface polished.
 - i*. Dark brown slip, incised decorations — horizontal and vertical lines.
 - j*. Light gray ware, plain surface.
 - k*. Black ware, plain surface; has suggestion of rudimentary animal features on opposite sides.
 - l*. Tripod form, dark gray, plain surface.
 - m*. Lower half painted red, upper half painted white with red figures.
 - n*. Light gray ware, plain surface.
 - o*. Dark gray ware, incised decorations on upper part.
 - p*. Dark gray ware, impressed decorations.
 - q*. Dark red slip.
- (*n*, *o*, *p*, and *q* are characterized by vertical spouts. Specimens from Mexico have vertical spouts attached at the upper end to the neck of the vessel, and serving also for handle.)
- r*. Dark gray ware, plain rough surface.
 - s*. Light gray ware, plain surface.
 - t*. Dark brown ware, plain surface.
 - u*. Brown slip, polished, animal features.

PLATE VIII.

Portions of terra-cotta figures and masks. *a* to *i* inclusive appear to have been portions of whistles or musical instruments; the remainder seem to have had no connection with objects of utility.

From excavations on the banks of the Uloa.

PLATE IX.

- a*. Whistle, human form, one vent, two notes.
- b*. Whistle, monkey, one vent, two notes.
- c*. Whistle, bird form, one vent, two notes.
- d*. Whistle, bird form, single note.
- e*. Whistle, quadruped, single note (broken).
- f*. Musical instrument, human form, two vents, equal in size, equally distant from mouthpiece; three notes.
- g*. Musical instrument, human form, two vents equal in size and equally distant from mouthpiece; three notes.
- h*. Whistle or musical instrument, human features (broken).
- i*. Double whistle, frogs mating.

- j.* Double whistle, frog form.
 - k.* Musical instrument, human form, two vents equal in size and equally distant from mouthpiece; three notes.
 - l.* Hollow image, human figure.
 - m.* Whistle, turtle form, one vent, two notes.
 - n.* Hollow image, nursing mother.
 - o.* Musical instrument, monkey form with extension at back, provided with a plain opening at the top for blowing; three vents, the two lower ones on opposite sides are equal in size and equally distant from mouthpiece; capacity five notes.
 - p.* Musical instrument, same type as last, animal form, three vents; capacity five notes.
 - q.* Musical instrument, same type as last two, bird form, three vents; capacity five notes.
 - r.* Musical instrument, human form, two vents equal in size and equally distant from mouthpiece; three notes.
 - s.* Musical instrument, human form, two vents, equal in size and equally distant from mouthpiece; three notes.
 - t.* Hollow image, human figure.
 - u.* Whistle or musical instrument (broken).
 - v.* Musical instrument, human form, two vents equal in size and equally distant from mouthpiece; three notes.
 - w.* Musical instrument, human form, two vents equal in size and equally distant from mouthpiece; three notes.
- From excavations on the banks of the Uloa.

PLATE X.

Portions of terra-cotta statuettes.

From excavations on the banks of the Uloa.

PLATE XI.

Terra-cotta stamps.

From excavations on the banks of the Uloa.

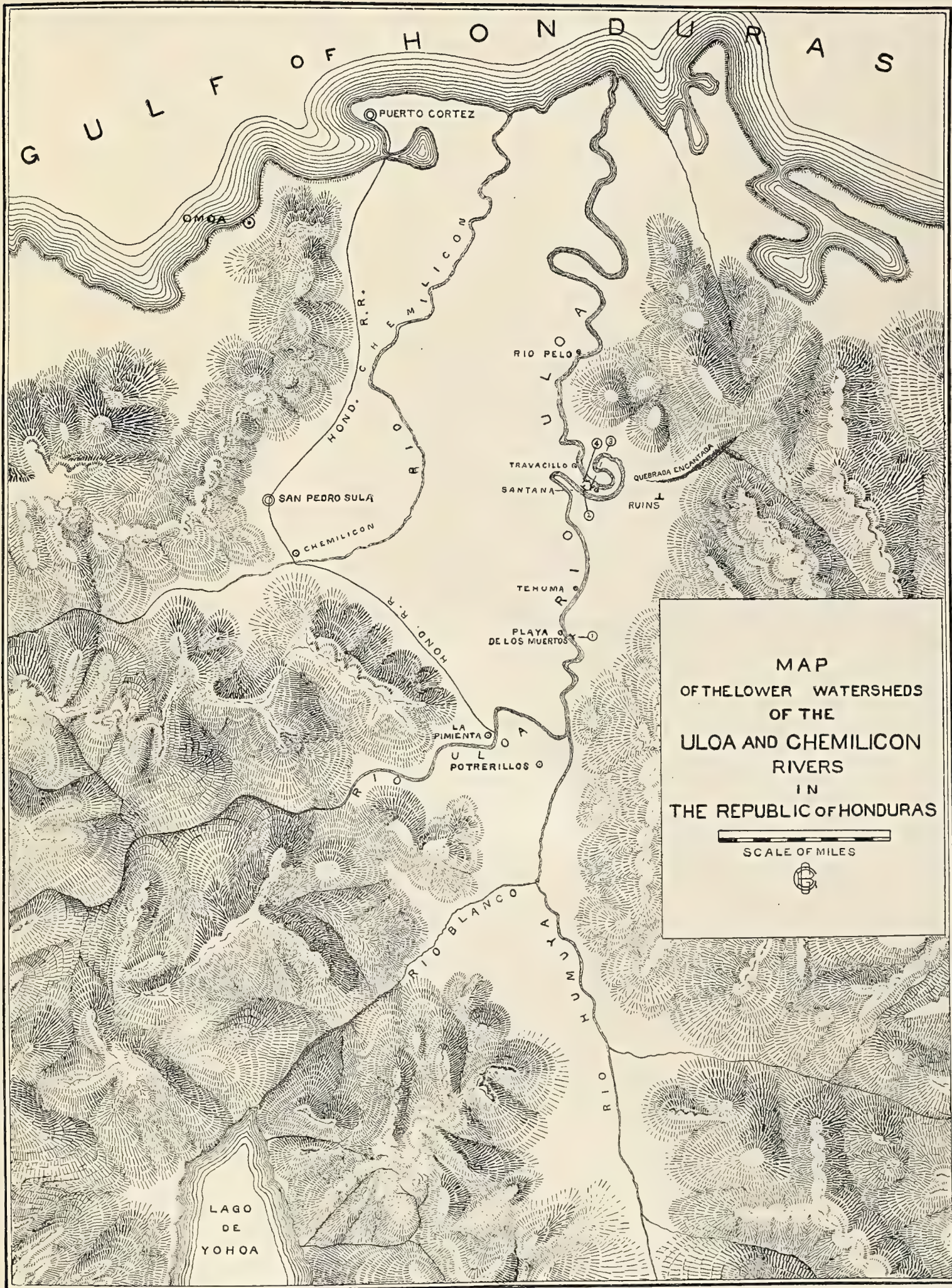
PLATE XII.

FIG. 1. *a, b, c*, terra-cotta masks, probably personal ornaments. They are perforated around the edges at the back, $\frac{2}{3}$ size. *d*, double paint-holder, $\frac{2}{3}$ size; *e, f*, calcite vases, $\frac{1}{2}$ size; *g*, fragment of a terra-cotta model of turkey, $\frac{1}{2}$ size; *h*, cup in shape of human head, $\frac{2}{3}$ size.

FIG. 2. View of waterfall and pool in the Quebrada Encantada (see page 14).

FIG. 3. Excavation at ruins near Quebrada Encantada.

11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100





a. DESIGN PAINTED ON VASE. THREE COLORS. $\frac{1}{2}$. Page 27.



b. DESIGN ON A FRAGMENT OF A LARGE VASE. GROUP C. TWO COLORS. $\frac{2}{3}$. Page 32.



DECORATION ON SURFACE OF VASE. GROUP A. DESIGN IN THREE COLORS. $\frac{1}{2}$. Page 27.



DECORATION ON SURFACE OF VASE. GROUP A. DESIGN IN THREE COLORS. $\frac{1}{2}$. Page 29.



FIG. 1. ULOA RIVER. EXCAVATION 3 AT THE LEFT.



FIG. 2. BANKS OF THE ULOA RIVER. EXCAVATION 4.



a



b



c



d



e



f



g



h



i



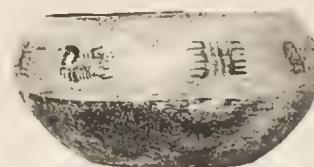
j



k



l



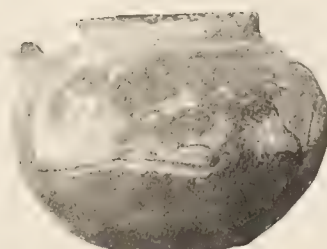
m



n



o



p



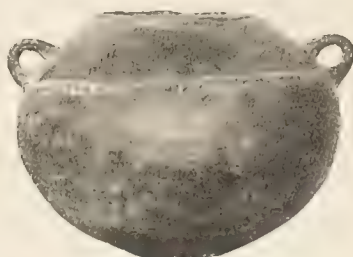
q



r



s



t



u

POTTERY FROM BANKS OF THE ULOA RIVER, SHOWING VARIETY OF FORMS. (About $\frac{1}{2}$.)



PORTIONS OF TERRA COTTA FIGURES AND MASKS. BANKS OF THE ULOA. (About 3.)



WHISTLES AND IMAGES. BANKS OF THE ULOA. (About $\frac{1}{2}$.)



a



b



c



d



f

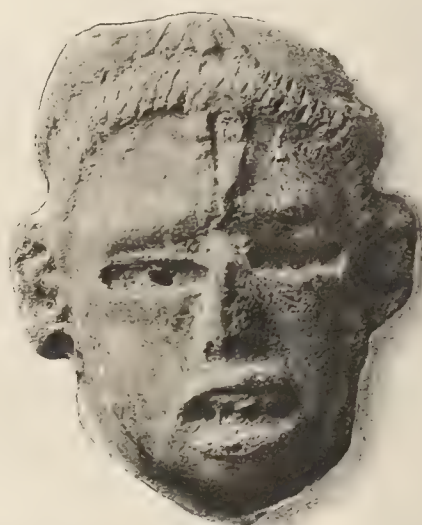
g



e



h



i

PORTIONS OF TERRA COTTA STATUETTES. BANKS OF THE ULOA. (About 4.)



TERRA COTTA STAMPS. BANKS OF THE ULOA. (About $\frac{1}{2}$.)

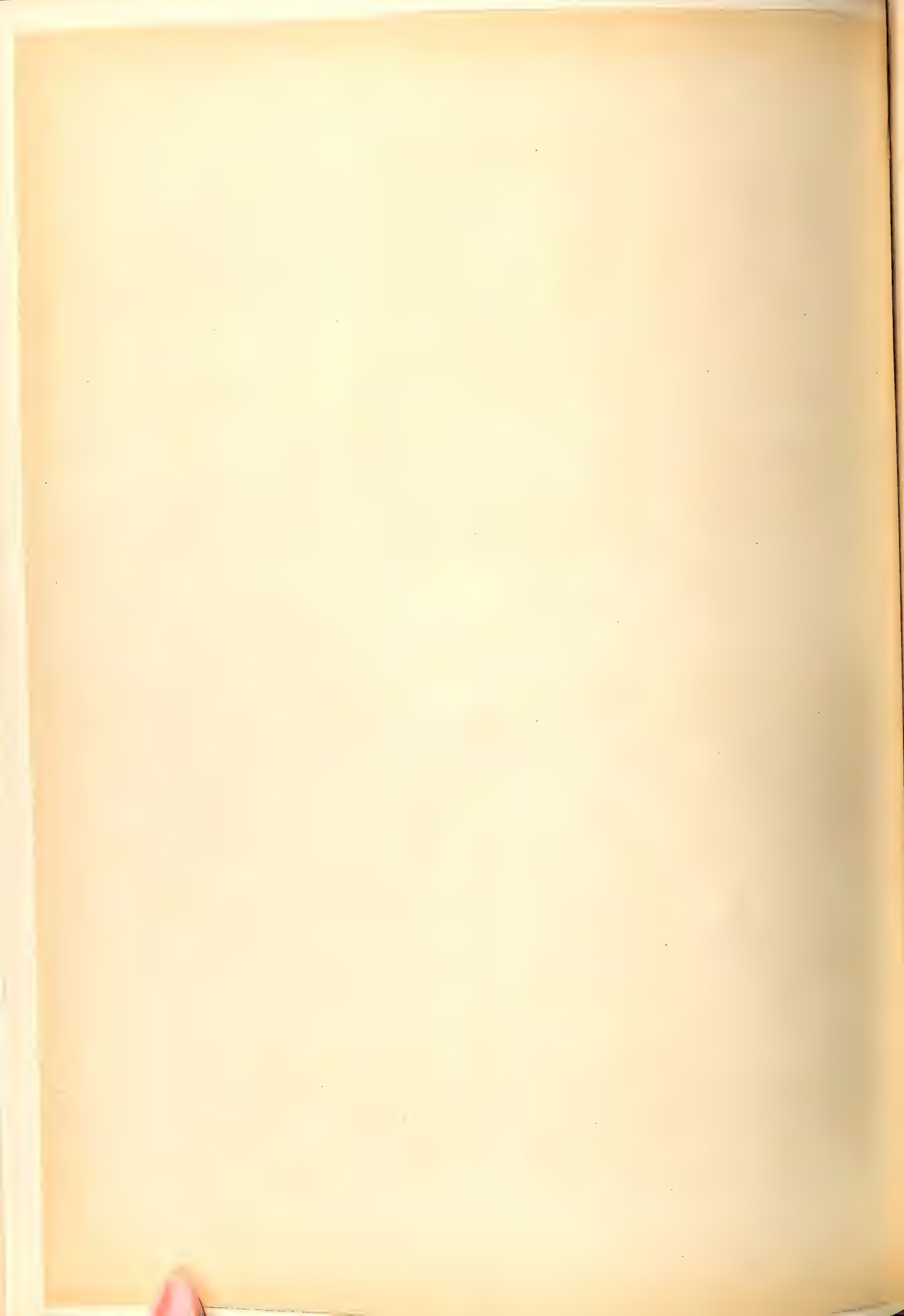




FIG. 1. OBJECTS FROM BANKS OF THE ULOA.



FIG. 2. WATERFALL AND POOL IN QUEBRADA ENCANTADA.



FIG. 3. EXCAVATIONS AT RUINS NEAR QUEBRADA ENCANTADA.

MEMOIRS
OF THE
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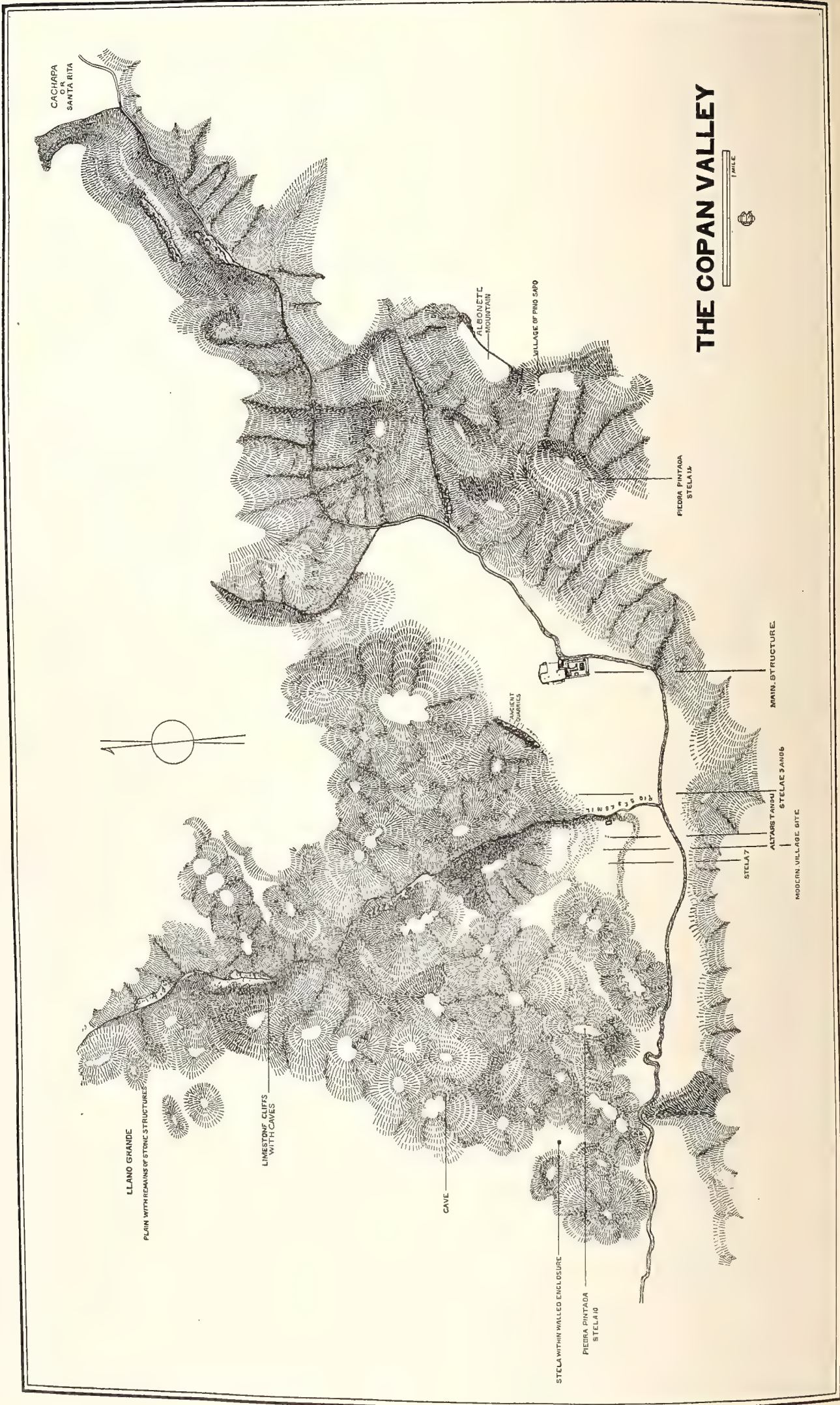
CAVERNS OF COPAN.

IN the mountains surrounding the valley in which the ruins of Copan are situated the rocks are of a twofold character. The lower rocks of the region, as I believe is the case throughout Central America, are limestone; overlying these are the beds of trachyte which furnished the building stone for the builders of Copan, and from which the ancient quarrymen hewed the massive blocks on which the sculptor carved those intricate designs which adorn the ruined temples and columns and altars to-day.

At a distance of about four miles from the principal group of ruins, towards the northwest, in a limestone ridge that rises abruptly from the rocky bed of a mountain stream called the Sesesmil, are a number of caverns, which I discovered and explored during the twelve days from April 1 to April 13, 1896, and revisited in June, 1897, to complete their examination. Along the course of the Sesesmil from its confluence with the Copan to a plain called Llano Grande, the outcrops are mostly of trachyte, except where the stream intersects the high ridge called Cerro Maria, the site of the caverns which are to be described.

The gorge occupied by the river is narrow, and the sides steep. The western side rises from the bed of the stream in a steep but even slope covered with a thick growth of medium-sized trees and by shrubbery, and overhung by rugged cliffs that rise in perpendicular masses for another five hundred feet, making a total height of a thousand feet from the stream to the top of the cliffs. The lower five hundred feet can be climbed by holding on to the trees and shrubs. The cliffs in places may be scaled for some distance by using a great deal of exertion and care, but to reach any of the caves except those at the base of the cliffs is extremely dangerous and difficult, if not impossible, for any one not practised in such exercise. The caverns which open into the face of these cliffs are therefore very difficult of approach.

The first of these which I entered is situated at a height of more than two hundred feet. After scaling the rocks, which afford few resting-places, the entrance of a passage is reached which runs upwards at an angle of 45° and parallel to the face of the cliff. The passage thus resembles a stairway closed on the outside by a wall of rock. At the top it expands into



a small chamber with a landing. At a height of about four feet above the floor is a natural opening like a window, whose dimensions are such that a medium-sized man might pass through with comfort, but to a very large man it would be inaccessible. It opens right on the face of the cliff, and overlooks a sheer descent of several hundred feet and the gorge of the river far below. Any one thrown from it would be mangled among the rocks at the base of the cliffs. On the outside, about three feet below the window, is a ledge, about two and a half feet in width, which ends abruptly to the right, and to the left leads around a turn in the face of the cliff and forms a sort of roadway to the entrance of the cave, which can be approached in no other way. This entrance is about six feet wide and ten feet high, expanding towards the interior, and forming a lofty vaulted chamber with projecting masses of dark rock oddly and fantastically shaped by the sport of nature. Just inside the entrance a large stalactite with its lower part broken away is carved into a rude likeness of a human head, with curved lines for the eyebrows and nose and round holes for eyes, mouth, and ears. This is the only bit of sculpture observed in any of the caves. There are no other stalactites in this cave, and there is no moisture. The deposit on the floor, which appears to be quite deep, consists of a fine dry light-colored earth. It did not have the appearance of having been trodden much, and the surface, though soft, was even and without marks. Fragments of pottery stuck through the surface. This cavern may be one hundred feet in length by fifty feet in width; no galleries were observed leading from it, and its only approach is that described. Besides the pottery, there were charcoal and pitch-pine firebrands which might be of almost any age; the conditions being as they are in the cave, this wood might endure for a great length of time.

The second cave is some seventy or eighty rods south of this, a little higher up and equally difficult to reach. It is smaller than the first, but otherwise the two are similar. A quantity of reeds, such as the natives use to-day for making partitions in their houses, and beds to sleep on, and for many other purposes, were lying on the floor. They were cut to a length of five or six feet, and had the appearance of great age.

The third cave, situated where a curve in the cliffs follows the slope upward, is farther north than either of those already described, and at a greater elevation. The entrance is almost hidden by a clump of bushes growing on a projecting ledge. This is the most interesting of the caverns discovered, and was explored to a greater extent than any of the others. It consists of three chambers, of which the first or outer is the largest. Just inside the entrance was an old abandoned eagle's nest surrounded by heaps of bones of small animals, such as squirrels, small hog, tepisquintli, young deer, and many other species. Overhanging masses of rock protect the entrance from the falling rains, and the interior is perfectly dry. The first

chamber is approximately circular in shape, and measures one hundred and fifty feet in diameter, rising to a lofty vault in the centre. The walls of dark gray limestone, without stalactites, present a gloomy appearance. Upon the floor the deposit is the same as that found in the other caves. When discovered, the surface was very even, without tracks or other disturbance, and offered no very firm resistance to the footstep, which sank half an inch in the dry powdery deposit. Numerous small fragments of pottery appeared sticking through, and in places were charcoal and dried-up hard-pine fire-brands, the remains of fires over which had accumulated an earthy dust to a depth of about two inches, representing the depth accumulated since the latest occupation. This surface dust is of the same character as the whole deposit on the bottom of the cavern, the depth of which was finally determined to be at one place fifteen feet. I believe this deposit to be formed by the dry decomposition of the rocks forming the walls.

The walls slope downward on all sides like a dome, meeting the floor at an angle and forming recesses all around. In one of these recesses

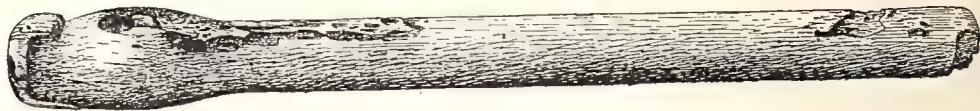


FIG. 1.—WOODEN AXE-HANDLE? FROM CAVE 3. $\frac{1}{4}$.

nearly opposite the entrance I found a wooden object, shown in Fig. 1. It was half buried in the dust, and had every appearance of having lain there a very long time. The state of the wood is not out of keeping with this supposition, because in the absence of moisture there was so little to aid in its decay that it might last for many centuries. A careful search was made in its vicinity for the tool to which it belonged, but no trace of it appeared, and no implement of any kind was found in any of the caverns.

An excavation twenty feet long and three feet wide was made in this part of the chamber. After the surface layer of dust came a thin crust, which must have been caused by the presence of moisture at some period. It was only a few inches in thickness, and beneath it the material was very dry, soft, and loose, so that the men were able to remove it easily without the use of picks. In the surface crust and beneath it to a depth of three feet were found ashes, charcoal, and potsherds. The latter are not numerous, and are of a coarse quality. At a depth of three feet the potsherds and ashes and all signs of occupation disappeared; the material excavated grew lighter in color, softer, and looser. In appearance and behavior it resembled quicklime, of which it largely consisted. Throughout the whole excavation the material removed rose in the air in thick clouds of suffocating dust.

The excavation was carried to a depth of fifteen feet, where the bottom of the cavern was reached in part of the excavation. On the rock floor were absolutely no traces of occupation.

Close under the sloping wall a skeleton was found ready to crumble. The skull was about six inches from the surface, and the earth rested so lightly upon it that it was still entire when found, but crumbled on being touched. By the skull was a small narrow-necked jar (Plate I., a). The body had been placed in a sitting posture, with knees at chin. In the left-hand side of the chamber, looking from the entrance, a small opening on the level of the floor leads downwards at an angle of 15° under the wall. It is just large enough to admit the body of a man lying flat, and is the end of a passage about forty feet long that leads to a small chamber which I have called No. 2. Though smaller — being only about fifty feet in diameter — this chamber was like the first in appearance, except that it contained more ashes. The floor was level and even, but the way it yielded to the footstep did not suggest any very extensive or recent occupation. As in the first chamber, fragments of pottery protruded from the surface, and one rough vessel rested on the floor near the centre. Near it was a slight rounded elevation which proved to be the remains of a fire, a heap of bones and ashes covered with dust. Over a part of these remains a stalagmite had begun to form, the only evidence of moisture having entered this cave. It was about six inches thick in the centre, thinning away at the edges; many of the charred bones were incorporated in its under part, showing that it had formed and had not been placed in that position. The rough jar which stood close by had the marks of fire upon it, and was probably a cooking-vessel. An excavation about eight feet in diameter and six feet deep was made in the centre of this chamber. Over everything, including the stalagmite, was a layer of dust; on the stalagmite it was at least one inch deep. As in the first chamber, fragments of pottery were found in the first three feet of depth, but after that none were found. During the work the whole chamber became filled with clouds of choking dust. From this chamber another passage similar to the first leads in the same direction to a third chamber, a long narrow gallery which looks like a rift in the rock running to a wedge at either end and at the top. It is eighty feet long and twenty feet wide at the widest part. The walls are black, the air close and foul, and altogether it is as repulsive a hole as could be found in the face of nature. The floor seemed more uneven than in either of the other chambers, and gave way still more to the pressure of the feet, and with a crushing sound. I soon discovered that I was walking upon the dust and crumbling bones of decomposed human bodies, mingled with ashes and lime. A mass of charred and calcined bones occupied the entire floor to a depth of about two feet. Among these were a few larger pieces which did not show traces of fire, and around the walls were found a number of small jars (Plate I., b, c, d, e, f). An excavation

was made across the centre of this chamber to a depth of three feet. In the last foot excavated the bones disappeared. It is hard to give a conception of what a disagreeable place this was to work in. Outside the mountain it was intensely hot, and inside the temperature seemed scarcely lower; add to this the close, stifling condition of the atmosphere, that made breathing difficult, and then the thick clouds of unsavory dust that filled the air at every disturbance of the decayed mass on the floor with its associated lime and ashes. The chamber seems to have been used for depositing the partly cremated remains of human bodies. I do not think that fires were built in this chamber itself, for there were no large fragments of charred wood such as would have marked the remains of a fire.

Cave No. 4 is close to No. 3, in an angle of the cliff. The first chamber is a dome-shaped cavity about one hundred feet across and very lofty in the centre. The floor had the usual appearance. At the side farthest from the entrance a rocky incline led upwards to an opening like a narrow doorway, guarded by a projecting wall of rock; this gave access to a small circular chamber from whose top a shaft leads almost vertically upwards to a height of forty feet, where a narrow passage leads horizontally to one side. Following this a distance of fifty feet, a long, low chamber is reached, quite damp and inhabited by myriads of bats. No digging was done here, and I cannot tell whether or not there are any human remains.

An old Ladino who lives at Llano Grande told me one day that there was when he was a boy a very large cave at a certain point in the lower slope of this same mountain. From the entrance a flight of hewn steps led downward a long way into the interior, and there were sculptured figures on the wall on both sides. People were afraid to enter it, but on one occasion he and a companion entered with a torch. They arrived at the bottom of the stairway, and walked on a level floor. There were statues standing around, and there were sculptures on the walls. They thought there might be gold hidden away somewhere, but after they had gone a little way they saw something that looked like the devil, and becoming afraid they ran out. So far as he knew, no one else had ever entered it, and some time afterward the entrance became closed up. He pretended to be able to point out the exact spot where it had been, and I had the bush cut over a considerable space and excavated, but found neither a cavern nor any indication of one. Either the old man was lying or he was mistaken about the location of his cave. They are fond of the marvellous, and like to make others gape with wonder at their experiences and tales. It is not at all unlikely, however, that my informant had known and entered some cave, that afterwards became lost, but his imagination aided his memory, and his love for the marvellous made his story easy. There was nothing artificial about the walls of the caves I examined, and with the single exception mentioned there were no sculptures of any kind.

In the eastern part of the same limestone formation is a cave of a different character from those described. In the upper slopes of the mountain, whose top is broad and flat, is an opening in the form of a well about ten feet in diameter and fifty feet deep. From the bottom of this well a shaft leads to a small chamber with a smooth floor of calcite with stalagmites standing like columns around the sides. The whole chamber is lined with white stalactites and delicate incrustations of calcite. At its extreme end the walls of this chamber converge toward the mouth of a vertical shaft a little larger than a man's body. On my second visit I was lowered through this opening by means of a stout rope brought for the purpose. At a depth of a few feet the walls of the shaft receded suddenly, leading to a dome-shaped cavern, very damp. From the enormous stalactites that depend from above, the water is constantly dripping, which keeps the rapidly forming calcareous deposit on the floor quite moist. There was no other opening but the one that I came through; and the only trace of human remains I found were the bones of a skeleton almost entirely embedded in the rock and much decomposed. This skeleton lay several yards from the point directly under the opening at the top, and was extended at full length. The depth of the cave was more than one hundred feet measured by the length of rope paid out, and it is therefore certain that a person falling through the opening would have been mangled, and his remains would have stayed where they had fallen, directly below the opening.

The pottery that was found in these caves is of a character entirely different from that found at Copan. Not a single piece can be said to bear any resemblance to Copan pottery, nor does it resemble the pottery of any other locality with which I am familiar. The facts already obtained do not lead us beyond the positive proof that in this region there once lived a people who made pottery of a different character from that pertaining to the people with whose remains in the same region we were already familiar, and that this people either dwelt in caves or resorted to them occasionally, from motives of practice, custom, or protection.

The evident strength and security of the position suggest their having been selected for defence; and in keeping with this are the natural conditions determining the mode of life, for races have only taken up their abode in caves where the inhospitable climate drove them to seek shelter there from storm and cold. In this region all the natural conditions are such as to induce an open-air mode of life. Then it is to be remembered that the caves now known could not accommodate very many persons, a few families at most, although it is not unlikely that there are other caves.

Again, the facts obtained in the caves do not seem to indicate a constant occupation for an extended period of time; the deposit is not compact and hard, even on top, as such an occupation by a number of persons would tend to make it. The absence of moisture would of course help to prevent

it from being compressed and hardened; and the water brought to the caves for use would have to be taken from the stream and raised with difficulty to a height of several hundred feet; consequently it would be used carefully and with little waste, and hence there would not be so much dampness attending the domestic life of the people as there usually is under ordinary conditions.

The presence of the mortuary chamber with so many bones, as well as the burial in the outer chamber of Cave 3, would seem to indicate a constant occupation or even seclusion. But we know, from the writings of the early Spanish priests, that among the Maya tribes of Central America there was an extensive cave cult, devoted to the worship of a cave god, and the rites and ceremonies were performed in caverns. They are probably identical with the so-called Nagualists whose holy places and sacred objects, says Brinton,* were in caves and deep rock-recesses and not in artificial structures. Moreover, according to the same author, they disposed of the bodies of the priests of their cult in the same caverns where they held their sacred mysteries.†

As to the age of these relics and the period to which they belong, there is little to give us any information, or to determine the relative place in history of the people they represent. Whether they preceded those who built Copan, came after or were contemporaneous with them, we have no data whatever for determining. The condition of the bones and of the wooden object, though not indicating of necessity any very great antiquity, proves they are of no very recent date, while the accumulation of a deposit from the decomposition of the rocks without the aid of moisture or vegetation, the formation of a stalagmite upon a bed of ashes and the subsequent deposition of a layer of dust argue a considerable antiquity. If we are to suppose these people were distinct from the builders of Copan, then where are they to be traced? where else are their remains to be found? May it not be (to hazard a guess) that these cave relics belong, after all, to the same period as Copan itself and are remains of the Copan people, or the devotees of some old cult among them whose temples were the caves and whose vessels used in the ritual were of a design and character exclusively their own.

As for the natives now living in the country, they neither knew of the existence of the caves nor exhibited any interest when they were made known to them, except in the fear that they displayed when asked to enter, which can be accounted for as the natural attitude of an ignorant and super-

* Daniel G. Brinton, *Nagualism*. Phila. 1894. Sec. 24.

† Ibid.

The same author states (*Myths of the New World*, New York, 1868), on the authority of Gumilla, that the Caribs preserved the bones of their dead hung upon the walls and doorways of their dwellings, like family armor and insignia; and the learned doctor adds, with an unconscious humor akin to that of the enthusiastic preacher who prayed the Lord to remember the people of uninhabited lands, that "when the quantity of these heirlooms became burdensome, they were removed to some inaccessible cavern and stowed away with reverential care" (page 256).

The Caribs, however, were a coast people, and are not known to have penetrated into the interior.

stitious people — with whom the devil is not only the ever-active enemy of mankind, but is responsible for everything not readily comprehensible to their minds — towards places of such a doubtful character as dark underground caverns.

CONTENTS OF CAVE POTTERY.

THE jar (Plate I., b.) from Cave 3 contained cremated bones of some small animal (too fragmentary to be identified), also a few charred fragments which are probably remains of an infant.

The jar (Plate I., c.) contained bones of a number of small rodents of different species. These bones are very old, but whether or not they underwent partial cremation is doubtful, for while some of the bones seem to show traces of fire, it is by no means certain that they do.

The jar (Plate I., d.) contained a few cremated fragments of the bones of a child, and a great number of bones of small rodents like those in the above-mentioned vessel. These latter retain what appear to be traces of fire, and I am inclined to regard them as having been subjected to partial cremation.

These bones of animals found in the pottery vessels from the cave indicate surely a custom which belonged to the people, of placing in the urns which were put with the dead the remains (cremated or otherwise) of certain species of small animals (generally rodents, if not always). The presence of the partially cremated remains of a child in one of the jars, and what appears to be the same thing in another, suggests that they are cinerary urns in which the cremated remains of children were placed, together with those of the animals above mentioned. It is possible, however, that the human remains may have fallen in, as the jars when found were among a great quantity of calcined human bones, while the animal bones, which in any case are too numerous to have come there accidentally, were found only inside the jars; and the signs of cremation, which in some cases are unmistakable, show that the animals to which they belonged were not intruders at a time subsequent to the burials.

NOTE ON THE FORMATION OF STALAGMITE.

The stalagmite formation found in Cave 3, chamber 2, over the remains of a fire and containing fragments of burnt bones embedded in its under side, furnishes no accurate measure of age, although it may imply a considerable lapse of time.

Stalagmitic growth is irregular, and depends upon a variety of conditions such as the amount of rainfall and the quantity of carbonic acid gas in the air. These conditions are variable, the amount of rainfall varying with locality, and the quantity of carbonic dioxide in the atmosphere depending upon the quantity of vegetation on the surface. The raindrops, taking up carbonic acid in their passage through the air or

in percolating through the surface soil, acquire thus the power of dissolving limestone through which they pass, and the carbonate of lime thus taken up is deposited in the interior as stalactites and stalagmites when the water evaporates. Thus the rate of growth depends also upon the amount of evaporation, for if the dripping water were allowed to run away or to become absorbed by the floor of the cave, it would carry most of its charge of lime with it. Therefore in a cave where the conditions are damp and the temperature low, the rate of growth would be slow, while in a cave containing less moisture and with a temperature relatively high the growth of calcareous deposits would be correspondingly rapid.

The conditions as regards temperature and humidity in Cave 3 at Copan are such as would favor rapid growth; while the amount of annual rainfall and the quantity of carbonic acid in the air are probably favorable to the same end.

The stalagmite under consideration had acquired a thickness of six inches, and with its corresponding stalactite was the only evidences of the entrance of water at any time. Its growth had long been stopped. It had partly decomposed, and had become covered with about an inch of dust from the decomposition of the walls of the cave.

It is not easy to make an estimate of the time that it took for these various phenomena to take place, data on the subject of stalagmitic formation being scarce.

When Kent's Cavern near Torquay in Devonshire was opened in 1825, inscriptions bearing the dates 1604, 1615, and 1688 were found upon the walls; the oldest of these dates was covered with a thin stalagmitic accretion showing an increase of one-twentieth of an inch in two hundred and fifty years.* If such an instance were taken as a standard, it would give a period of thirty thousand years to the formation of the stalagmite in question.

This of course would not do; the conditions which would determine the growth in the two cases are very different. Although the annual rainfall is probably not very different, and the amount of carbonic acid in the air may be taken as the same, the average temperature, which is a very important determining factor, is very different in Devonshire and Honduras, while the conditions pertaining in the interior of Kent's Cavern, where there is much moisture and low temperature, are the reverse of those pertaining to Cave 3.

In the Cave of Ingleborough, where rapid evaporation is caused by air currents, a stalagmite on which observations have been made since 1839, has been growing at a rate of about three-tenths of an inch annually. It is evident, therefore, that the presence of a few inches of stalagmite is of little value in determining lapse of time.

* Transactions of the Edinburgh Geological Society, 1886-87.





a



b



c



d



e



f

POTTERY FROM CAVERNS OF COPAN.

MEMOIRS

OF THE

PEABODY MUSEUM OF AMERICAN ARCHAEOLOGY AND
ETHNOLOGY, HARVARD UNIVERSITY

VOL. I—No. 6

THE HIEROGLYPHIC STAIRWAY

RUINS OF COPAN

REPORT ON EXPLORATIONS BY THE MUSEUM

BY

GEORGE BYRON GORDON

CAMBRIDGE

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EDITORIAL NOTE.

THE Hieroglyphic Stairway on the side of one of the great pyramidal structures of the ruins of Copan has excited special interest from the time of the first account of the ruins given by Palacio in 1570. When our second expedition, under the lamented Owens, began the work of clearing the débris from the steps, the importance of the stairway, particularly on account of the hieroglyphic inscription, was fully realized. From that time the successive expeditions have worked at the stairway until it has been the good fortune of Mr. Gordon to complete its examination and to make photographs and moulds of the sculptured faces of the steps.

It is greatly to be regretted that an earthquake, or possibly the gradual disintegration of the sustaining structure, had caused the upper part of this impressive stairway to slide down over the lower portion, thus displacing the upper steps and throwing them out of their original position. The sequence of the greater part of the inscription upon the front of the steps is thus lost. Mr. Gordon has done all that could be done to match the stones of this disturbed portion, as shown by the photographs and drawings accompanying this memoir. The inscription is made the subject of his researches in the second part of the memoir.

Moulds of all the hieroglyphs and sculptures on the stairway have been made during the several expeditions, and when room is provided in the Museum for the exhibition of the casts in their proper sequence, the wonderful Hieroglyphic Stairway will prove a most interesting object for study.

The antiquity of Copan becomes impressive in view of Mr. Gordon's deductions that this stairway bears an inscription over seven hundred years later than any other inscription, yet found on the monuments of this ancient city, the initial date of which has been determined.

This number completes the first volume of the Museum Memoirs. The expenses of publishing this memoir and of the last expedition have been defrayed by the annual subscriptions to the Central American Fund.

F. W. PUTNAM,
Curator of the Museum.

HARVARD UNIVERSITY,
DECEMBER, 1901.

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THE HIEROGLYPHIC STAIRWAY RUINS OF COPAN

ARCHITECTURE.

ON the extreme northern end of the Main Structure at Copan, rising to a height of about eighty-five feet above the Great Plaza which extends from its base northward, is the pyramidal foundation No. 26.* On its southern side it is attached to the great pile of which it forms a sort of wing, while the northern and eastern sides rise in terraces which were probably seven feet high, five feet broad, and faced with neatly cut oblong blocks of stone; the top of each forming a smooth firm floor of mortar cement (Fig. 1). These terraces have nearly all fallen, exposing the interior of the structure, which consists of rough blocks of stone and clay firmly packed together. On the east side there is nothing to indicate that this falling away of the terraces was due to other agencies than the growth of trees and the pressure of the material fallen from above which caused a gradual disintegration of the outer casing. On the northern side, however, there has been a landslide by which the whole of that side, except the very lower part, was scooped out and the débris piled on the bottom of the slope and on the plaza. At the time of the arrival of the first expedition, in 1891, the whole structure was covered with heavy timber trees, some of them very large. In its present

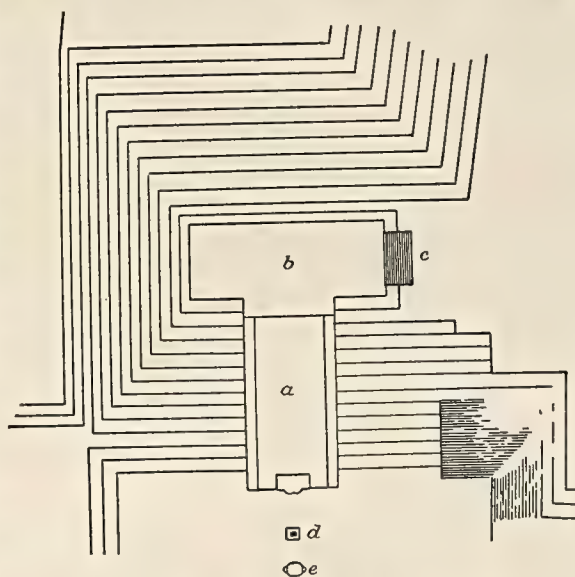


FIG. 1. — PLAN OF MOUND 26, RESTORED.

a, Hieroglyphic Stairway. *b*, Platform on which the Temple stood. *c*, Flight of Plain Steps leading to Temple from Elevation on South Side. *d*, Stela M. *e*, Altar M.

* See Memoirs Peabody Museum, Vol. I, No. 1, for plan of the Main Structure.

condition the pyramid rises almost to a point, leaving apparently but little space on top for a building; but as the top has been reduced in size by landslides, and building stones as well as sculptures were found overlying the slopes and the level ground below, there is every reason to believe that a building of some sort once stood there, though not a trace of it remains in position, not even of the foundations (Plate I).

The western side of this pyramidal structure presents the ruins of the greatest architectural feature that has yet come to our knowledge at Copan, — the Hieroglyphic Stairway.

Stephens,* although he refers to this slope and speaks of quantities of sculptures, does not mention any stairway. He mentions "rows of death's heads" and the "trunk of a colossal ape," from which it is evident that he has confused two localities in his description. The death's heads, one of which he figures on page 135 of Vol. I, are on the western slope of Mound 16 and not on Mound 26.

Maudslay, who was the first to direct attention to the stairway and to the excellence of its design and workmanship and who gave it the name by which it has since become known, ascertained, by means of excavations in the summit of the mound, that no portion of a building remained on that elevation. He rightly concluded, however, that a building once stood there. A fragment of the inscription on the steps is figured on page 32 of his text.†

As has already been mentioned, the north side of this same pyramid has been destroyed by a landslide; so on this western side also, where the stairway ran from the base to the summit, a similar accident has taken place. The whole upper part of the stairway from the top to more than half-way down was thrown from its place, and, together with a large quantity of the filling underneath, was precipitated to the bottom, covering the lower steps, which still remained in position, with a heap of débris, burying them to a depth of twelve feet and completely hiding them from view. In this downward journey fifteen only of the displaced steps retained to some degree their identity and relative positions, the topmost of these coming to rest at about fifty-six feet from the ground below. These are the steps that Maudslay described and which he believed to be in position.

It is impossible to tell from actual conditions at what time in the history of the city these landslides took place. The localities where they occurred were well wooded in 1891; but the growth of trees in that climate is of little value in determining lapse of time. There are a few historical references, however, that, if they are worth anything at all, would seem to indicate that these accidents took place in comparatively recent times.

* Incidents of Travel in Central America.

† Compare Plate XII of the present Memoir, G, 1st block. The drawing on page 16 of Maudslay's work (*Biologia Centrali Americana; Archaeology*) represents the opposite side of the sculpture shown on Plate 9, b (Maudslay), and not part of a step of the Hieroglyphic Stairway as it is labelled.

Palacio, in his letter to the King of Spain (1570), spoke of "a grand stairway descending by a great number of steps to the river." * At the present day there is no stairway whatever on that side of the structure next the river, nor is there any sign of one having existed. It is true that this side has been entirely destroyed by the river, but this had been accomplished at least in part at the time of Palacio's visit, and while a great stairway may at that time have existed on the river side, the absence of any evidence leads to the suggestion that Palacio may have meant the Hieroglyphic Stairway, the only one corresponding to his description that has come under our observation. If so, it must have been at that time entire, reaching from the plaza to the summit of the pyramidal structure, for in its later condition after the landslide, in which condition Stephens failed to notice it, although he described adjacent monuments, it could hardly have elicited the comment of Palacio already quoted.

Furthermore, in 1854 the German traveller Dr. Carl Scherzer was on his way to visit the ruins, but having arrived at Santa Rosa, he was warned by the padre and others against proceeding on a journey so dangerous to life and property. He has recorded that the padre at Santa Rosa informed him that "a recent landslip had much injured the effect of the ruins." †

Now, the two landslides just described are the only ones of which I have any knowledge at Copan, and the one by which the Hieroglyphic Stairway was destroyed is the only one that has materially injured the effect of the ruins. Before its destruction the Hieroglyphic Stairway was probably the feature that most of all attracted the attention and excited the wonder of the natives, and it is not surprising that the padre said the landslide had spoiled the effect of the ruins. The priest spoke (in 1854) of the landslide as recent, but the stairway must have been thrown down before the time of Stephens' visit (in 1840), as otherwise it would hardly have escaped his notice.

In December, 1892, Mr. Owens, supposing the steps which were then visible on the slope to be a stairway in position, began clearing them of the débris that partly hid them, but found that they stopped suddenly some distance from the bottom of the slope. Here he began to dig, and encountered a confused mass of broken sculptures.

At this stage of the work Owens left the ruins on the journey that proved to be his last. After his return he was anxious to have the excavation continued, though unable to superintend it himself on account of his illness; and the survey that I was engaged in making was suspended that this work might be carried on. During this time the altar and bottom steps were reached, and Owens made an attempt to inspect the

* See Memoirs Peabody Museum, Vol. I, No. 1, for the part of Palacio's letter which refers to Copan.

† Travels in the Free States of Nicaragua, Honduras, and Salvador, Vol. II, p. 95.

work, but his strength failed before he reached the site and he had to be assisted back to his cot, from which he never rose. We have not therefore the benefit of his mature opinion respecting the evidence of a landslide. I feel sure, however, that had he lived to weigh the evidence there would have been no doubt of it in his mind. Following are given in full the few brief notes left by Owens respecting the stairway:—

“Field notes on the excavation of Mound 26:—A few workmen were put clearing what is known as the Hieroglyphic Stairway for the purpose of taking moulds of the best sculptures. In a few hours they had uncovered so many nice pieces of sculpture that I considered it worth while to continue work in that place.

“For several days the work has been going on, and we have found a good many fine pieces of workmanship. At the bottom of the stairs sculptured stones were found below what must have been the line of the steps when in position. A few of the surfaces show signs of burning. To-day, Dec. 28th, we found a fine head and later part of the bust of what must have been a very fine figure [Plate XIV]. The decoration is much like Stela I. The decoration of the shoulders is exceedingly fine. But more odd is a death's head much destroyed across the breast. This is the first and only case of this kind that I have seen in the ruins.

“Dec. 29 & 30. Work was continued on this mound, and many fine pieces of sculpture were encountered, many of them surely below the line of the steps. It would seem as though the steps had been built up on these. To-day, 30th, another torso [shoulders with death's head on breastplate, Plate XV] was found with a death's head exactly like the one mentioned above.

“Jan. 5th. During the present week work has been continued on the mound and we have removed many fine sculptures from the region of the stairway. One very interesting piece resembles a rattlesnake [Plate XIII, A].”

Here the notes stop abruptly. From the time that I took charge of the excavation until within a few days of Owens' death, when the work was stopped, many sculptures were removed, mostly loose blocks from the broken steps. A view of the stairway as it appeared when work was discontinued is given in No. 1 of this volume of Memoirs (Plate V, Fig. 1).

Should it be asked what is the nature of the evidence pointing to the occurrence of a landslide, and how it can be proved that one stairway was not built upon the other, it may be answered that the general condition of things pointed unmistakably to a landslide (Fig. 2).

The sculptures removed during the excavation were, for the most part, of a fragmentary nature. In some cases several parts of a figure or other object were found and fitted together, as in the statue shown on Plate XIV and the coiled serpents on Plate XIII, A, but in the great majority of cases only mere fragments were found. The remaining portions must either have been ground to powder by the landslide or have been reduced by disintegration to unrecognizable shapes. A large proportion of the sculptures removed from this mass of débris consisted of blocks

which had once formed parts of steps, their relative positions no longer preserved. In many instances it is possible to recognize blocks which occupied adjacent positions in the stairway by correspondence of lines; but where the carving is indistinct or the joint falls on a blank space, the blocks will have to remain in their disorganized condition until some other method shall have been devised for their restoration.

The excavation of the stairway was resumed in 1895. The steps that had been carried down bodily by the landslide and still occupied the middle of the slope were lowered down block by block and arranged in their proper relative positions on the level floor of the plaza, in which position photographs and moulds were made of the carvings on their faces (Plates II and V).

Few of these steps are complete, blocks are missing from the ends or from other parts, and the carvings, having been exposed to the weather and to the impact of loose stones falling from the upper part of the slope, are much damaged. Many of the characters are so indistinct that they can be identified only by careful comparison with others, if at all, while many more are among the best and most perfect examples of hieroglyphic carving at Copan. It was not until 1899 that the final work of excavation was done and the lower part of the stairway cleared.

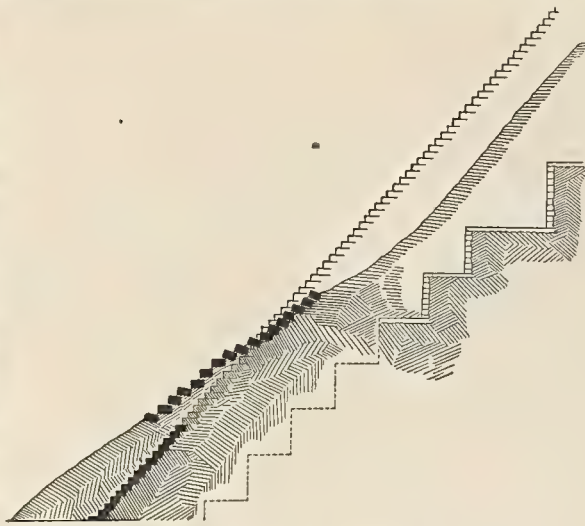


FIG. 2.—CROSS SECTION THROUGH WESTERN SIDE OF MOUND 26, SHOWING LANDSLIDE, STEPS IN POSITION, AND TERRACES IN THE INTERIOR OF THE MOUND.

It was found that only ten entire steps remain in position. The next two steps are almost complete, while portions of three more retain their places, making in all fifteen steps with hieroglyphs, that are not entirely displaced. This does not include the lowest step of all, which is lower in the rise and wider in the tread than the others and without hieroglyphs (Plates III and IV).

A large altar (Plates VII, VIII, and IX), built into the stairway at the base, rises to the level of the top of the fourth step (not counting the first step). This altar was very elaborately carved over the entire surface, which however was very badly defaced when uncovered, much of the carving being entirely destroyed. The top of this altar consists of four large slabs let into the steps (Figs. 3 and 4). A photograph of a cast of the upper surface is shown on Plate XI. The carving here, being directly exposed to the

action of the weather and to the impact of loose stones falling down the slope before the landslide took place, is so worn that I am unable to make much out of it, but there seems to have been an elaborate grouping of human figures and other objects, as well as a number of hieroglyphs. The

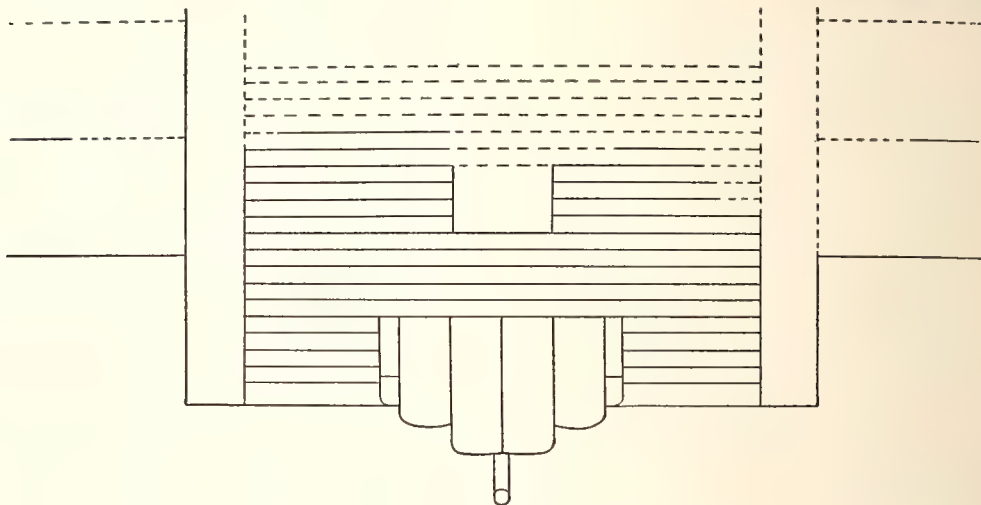


FIG. 3. — PLAN OF LOWER PORTION OF STAIRWAY WITH ALTAR AT BASE.

whole design of the altar seems to have been meant for a huge serpent's head, and it is probable that the stairway itself represented the body of a great serpent.

Immediately above the altar, at the height of five steps, is a large seated figure built of three pieces of stone and let into the centre of the stairway.

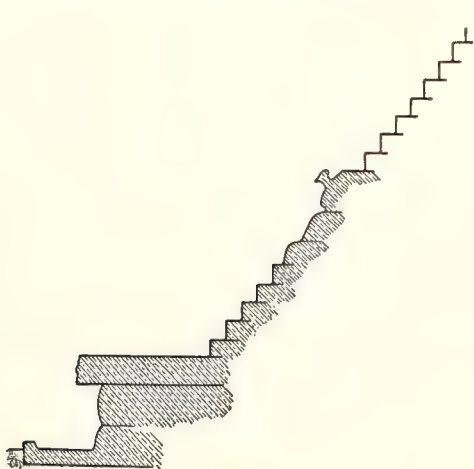


FIG. 4. — CROSS SECTION THROUGH LOWER PORTION OF STAIRWAY.

The figure is arrayed in the usual elaborate adornment. The enormous headdress represents the upper part of the head of some animal, the lower jaw of which extends across the breast in the form of a breastplate; a great shield rests on the left shoulder, hiding that arm and hand; the right arm is extended outward and forward, and the hand formerly held some object which has been broken away. The projecting snout of the animal in the headdress had been broken off and was found in 1900 among a heap of fragments on the plaza below. It had evidently been exposed to the weather a long time, but apart from being stained nearly black it showed no more weathering than the remainder of the head.

In the centre of step M (Plate V) may be seen the lower portion of a similar figure, while the steps immediately above this are plain where the

figure had been built up against them or let in. Only a few small fragments of the upper portion of this figure were found among the débris.

During the excavation in 1893 another similar figure was removed from the débris buried beneath the landslide, near the median line of the stairway (Plate XIV and Fig. 5). Besides these three figures, portions of two other similar ones were found among the débris, showing that there were not less than five of these figures placed at intervals in the centre of the stairway. It is probable that the altar already mentioned bore the same relation to all these figures that the altars in front of the stelæ bore to the corresponding statues.

The stairway was guarded on either side by a sort of balustrade, now almost entirely destroyed, built on a line corresponding to the outer corners of the steps. The sloping surface of this structure was decorated by the serpent and bird symbols alternating in the ascent; the one in profile and the other in front view. The latter extended across the balustrade and projected one foot beyond the outer surface, the ends being rounded downward. All the stones in these side structures were cut with bevel faces. The portions farthest from the steps in the intervals between the bird ornaments were lower by about four inches than the rest, and were constructed of plain stones, but it is not unlikely that these stones were covered by stucco which may have been modelled (Fig. 6).

The whole stairway projects seven feet six inches in front of the terraces which form the casing of the mound on either side of it. The measurements made are as follows:—

Entire width of stairway not including the balustrades	26' 2"
Width of each balustrade	3' 6"
Width of altar across top	10' 6"
Width of altar, bottom	12' 2"
Altar top projects in front of step	7' 0"
Height of altar	5' 0"

The plaza in front of the stairway was paved with a thick layer of mortar cement laid over broken stone. This pavement remains entire for a distance of ten or fifteen feet in front of the stairway; beyond that it is broken up. There was a sort of turned up nose or tongue which projected from the centre of the altar on a level with the pavement for a distance of four feet; this upturned portion is broken off six inches above the pavement, leaving doubtful the manner in which it ended.

The entire slope from the base of the stairway to the top of the mound measures one hundred and twenty-five feet, while the portion remaining in position measures twenty-five feet, or one-fifth of the whole distance. Estimating in this way, the whole number of steps in the stairway when entire would be eighty (Plate XVIII). It is probable that the foundations of the edifice which we have inferred stood upon the summit were at a slightly

greater elevation than the present summit, the height having been reduced somewhat, it would appear, by gradual falling away as well as by the landslides. The steps average nearly one foot in height, and the present height of the mound (eighty-five feet) would require about eighty-five steps of the same average height to reach to the top. If we suppose the height of the mound to have



FIG. 5.—DRAWING OF ONE OF THE SEATED FIGURES, PARTLY RESTORED.
From the original sculpture.

been reduced five feet, which does not seem improbable, this would bring the number of steps up to ninety. The ornament on the balustrades which I have called a bird symbol, probably continued alternating with the serpent's jaws all the way up. This ornament was always carved on a single stone, unlike the serpent with which it is associated, which was always constructed of several stones fitted together, and for that reason was more easily lost or destroyed. Only one of these bird symbols remained in position. It was

on the left side of the stairway, and with it in position were portions of two serpent symbols, one above and one below. Among the débris removed during excavation were a great many portions of similar serpent ornaments, but most were badly broken. Of the bird ornaments, I counted thirty, many of which were entire. It is altogether probable that several of these were lost, one cannot tell how many, but the count of thirty would leave

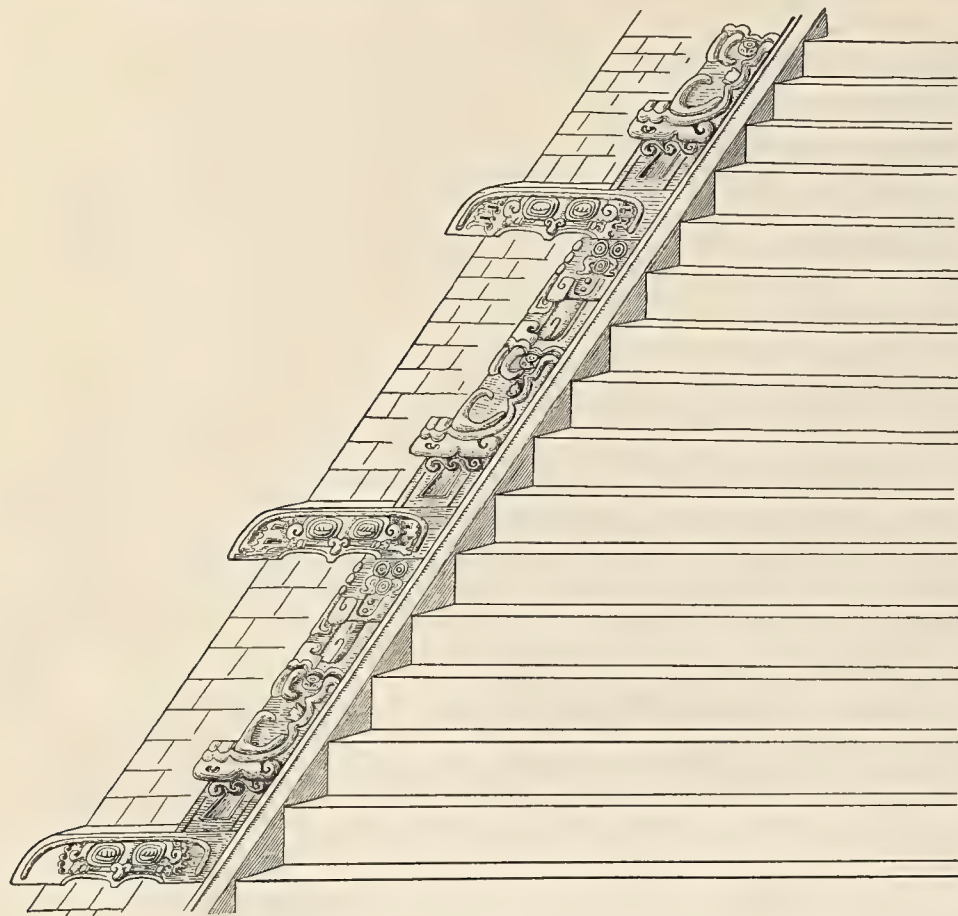


FIG. 6. — DETAILS OF BALUSTRADE. RESTORATION.

fifteen on a side, and as there are about five steps to each of these ornaments, according to the most careful measurements that could be obtained, this would bring the number of steps in the stairway up to seventy-five; but since we cannot tell how many of these ornaments were totally lost, this is as far as the estimate will take us. In any case the number of steps originally in the stairway was not less than eighty-five, and possibly amounted to upward of ninety, whereas the total number which we are able to reproduce is only twenty-seven, and many of these have large portions missing, and they are not continuous, but in two separate sets.

On all the lower steps that are complete and on which the glyphs are continuous from one end to the other, there are twenty squares or glyphs; but this system would not seem to have been adhered to throughout, and the squares do not fall in columns, and as will appear must be read in lines along the steps. The regular lines of squares are interrupted not only by the large seated figures in the centre but by reclining figures, which sometimes occupy the centre, but in other instances occupy different positions. The crouching figure in the centre of steps E and F (Plate V), of which a drawing is shown in Fig. 7, is the only one of the kind

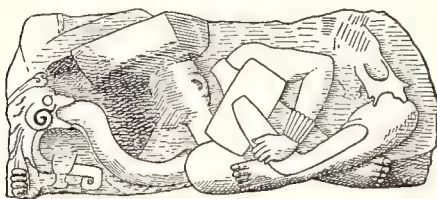


FIG. 7. — CROUCHING FIGURE IN CENTRE OF STEPS E AND F, PLATE V.

encountered. This curious sculpture is difficult to understand, and unfortunately it is rather badly worn. It represents a figure about life size, sitting cross-legged, with the body bent toward the right. The extended right hand grasps what seems to be the fish that is usually attached to what Maudslay calls the water-plant, on the flower of which the fish, wherever it occurs, seems to be feeding. The animal here shown very closely resembles this fish, as usually represented, as, for instance, on Stela N at Copan and on pottery figures found in Vera Paz.* If this be the right understanding of the sculpture, the fish has in this instance swallowed the flower of the water-plant, the stem of which protrudes from the open mouth and disappears behind the crouching figure. The object resting on the left knee of this figure is not unlike parts of the water plant.

Immediately below this on the next step is a reclining figure which occurs again on step H (Plate VI). Each of these figures occupies the central portion of a step, and on step D and on step J (Plate V) the squares are again interrupted by reclining figures. Other figures of this sort may be seen on Plate XII, where they appear on loose blocks which formed parts of steps. It is doubtful whether all or any of these figures are intended to represent persons in a reclining attitude. They rather create the impression of persons standing upright, and that the apparent attitude was adopted by the artists in order to conform to the face of the step. It may be stated that all the portions of steps on which the glyphs are at all distinct are reproduced in this memoir; there are many others on which the hieroglyphs are quite illegible and are indicated only by the outlines of the squares. The greater part of the missing steps and inscription is irretrievably lost. Altogether what remains of the Hieroglyphic Stairway is scarcely more than a fragment. Of the inscription with which it was decorated, the longest hieroglyphic inscription that has

* For illustrations of the various examples of the water plant, see Maudslay, Vol. IV, Plates 92 and 93.

yet come to light among the Maya ruins, only broken fragments remain; the greater part is lost beyond hope of recovery.

Of the temple, or other edifice, to which this great stairway was the approach, next to nothing can be said. The fragments of sculpture overlying the slopes and mingled with the ruins of the stairway show that it possessed features of great artistic merit. Doubtless it was one of the most striking edifices at Copan, and at first thought it seems strange that nothing should have remained of it; but the height of the pyramidal foundation on which it stood and the steepness of the slopes made its position rather insecure, while the landslides must have contributed greatly to its ultimate destruction.

There was another approach to this building from the south by a flight of plain steps leading up from the level terrace just west of Temple 22 (see plan, Fig. 1). Seen from this elevation, the Hieroglyphic Stairway, with the temple above it, must have presented a most striking appearance. Certainly no more impressive spectacle was offered by the architecture of Copan, and probably nowhere in all ancient America could be found anything to compare with it. The stone from which it was built was the same as that from which the stelæ are carved (trachyte), and seems to have been carefully selected with regard to fineness and uniformity of color. Those parts that had been long exposed had become stained by the vegetation, but when the base of the stairway was uncovered and washed free of adhering clay, the stone presented a bright fresh surface, of uniform color, a light delicate shade of green, which was very effective.

In the plan of Mound 26, shown in Fig. 1, an attempt is made to restore its lines and show the platform on top which probably supported the temple. Most of the terraces here represented are destroyed. On the north side portions of three only remain, the lower ones, and in the restoration the measurements of these are adopted; on the east side a number of the terraces were found intact near the inner angle, and the measurements obtained of these have been used for the reconstruction of the terraces on that side. On the western slope at either side of the stairway, all the terraces are destroyed, with the exception of portions of the lowest, and a smaller fragment of the second, and it has been assumed that those above were uniform with these.

An excavation was made by Maudslay in the western side of the mound just above the flight of steps carried down by the landslide and at that time resting on the slope. In this excavation three terraces were brought to light, the lower one, seven feet high and six feet broad, the next seven feet high and twelve feet broad and the upper one ten feet high (see Fig. 2). There is no doubt other terraces exist, both above and below these. Maudslay expresses the opinion that these, as well as similar

walls exposed on the river front, were incorporated in the structures to strengthen them and guard against landslides. It now seems certain, however, that these interior walls and terraces are the remains of older structures or the foundations of older buildings, and indicate either a destruction of the city at some earlier period of its history, or else a practice which prevailed among the builders of erecting their later and more pretentious works as it were on top of the earlier ones. Wherever excavations have been made at Copan in the foundations of structures and even below the level of the Great Plaza, the remains of older walls and terraces and pavements have been found, and certainly the whole of the Main Structure is built over the remains of older structures; and in some parts at least these older works occur not in one layer only, but in several distinct layers, corresponding to different building periods.

In line with the centre of the Hieroglyphic Stairway and at a distance of fifteen feet in front of it stood Stela M, one of the most elaborately and delicately carved of all the stelæ at Copan. This stela and its altar are so associated with the stairway that a description of them will be given in this connection. Stela M is now fallen and broken, and nearly all of its intricate sculpture has been destroyed, only a few fragments of its elaborate scrolls and of the little figures with which its edges were adorned remain to show the character of the sculpture; while a number of small fragments of beautiful carving lie scattered about, too minute to furnish material for the restoration of the design. On the front, the side farthest from the stairway, was the usual human figure now largely effaced, and on the opposite side facing the stairway was a hieroglyphic inscription, a drawing of which is given by Maudslay on Plate 74 of his series. The height of this monument is ten feet, and its width two feet six inches (Plate XVI).

The flat slab which served as a pedestal for the monument is still in place, as well as the oblong blocks which supported it at the four sides. The two pieces of the fallen stela were removed a short distance to the right, in 1900, while the stairway was being cleared and photographed; afterward I attempted, by means of pulleys and shear legs, to replace it on its pedestal standing in its original position, but much to my regret the blocks were not strong enough, and the tackle with which I was trying to hoist the upper portion into position collapsed, and I gave up the attempt.

At a distance of ten feet in front of Stela M is the altar corresponding to it and known as Altar M. Maudslay describes this altar as follows: "Within a few feet of Stela M is an altar which may be roughly described as a square-shaped block of stone fashioned into the form of a four-legged grotesque animal without a head. In the flat surface both on the front and back of the monument, there is a large hole and it seems probable that into these holes heads had formerly been fitted. The animal represented may have been the double-headed dragon. . . .

"Close to this altar a stone head was found with a tenon attached, which fitted fairly well into the hole in the front of the altar. The head is shown in this position in the photograph. There is a four-lobed mark on the forehead as well as the peculiar marks . . . usually found in connection with one of the heads of the two-headed dragon. The photograph is not sufficiently good to show the hole in the back of the altar into which, if the suggestion made be correct, the second head of the dragon would have been fitted."

The suggestion is undoubtedly correct. Not only would the head, which Maudslay mentions and of which he gives a photograph showing it in place on the southern end of the altar on Plate 75 of his series, seem beyond doubt to belong here, but the other head has been identified and replaced in its original position on the northern end of the altar. This head was mentioned by Stephens and a drawing of it is given on page 136 of Vol. I of his work. His description is as follows: "Among the fragments lying on the ground near this place is a remarkable portrait. It is probably the portrait of some king, chieftain, or sage. The mouth is injured, and part of the ornament over the wreath that crowns the head. The expression is noble and severe, and the whole character shows a close imitation of nature."

The "portrait" is held in the open jaws of the dragon.

This sculpture was found lying among a mass of fragments about a dozen yards from the altar in 1900. The tenon attached to the back had been broken off, but a portion remained, and a trial showed that it fitted fairly well into the hole in the altar; also the plain surface on that end of the altar corresponded, in dimensions, with the back of the head (see Plate XVII). The altar thus appears complete, and represents the double-headed dragon, the "long-nosed head" being on the northern end and the "short-nosed head" on the southern end.

Among the ornaments pertaining to the stairway one of the most remarkable is a pair of serpents with interlocking coils (Plate XIII, A and Fig. 8). This sculpture was found well underneath the landslip, and the inference would be that it had occupied a position on the stairway somewhere between the two sections shown on Plates V and VI. It is only a fragment found in three pieces, and although these are in an excellent state of preservation, large portions of the ornament seemed to have disappeared.

Two rattlesnakes are represented with their tails in opposite directions. The rear ends of the bodies form a pair of interlocking loops placed horizontally. After this the bodies turn downward, but here a portion is missing. The snakes are stretched upon a groundwork of plumes, doubtless those of the quetzal, and these feathers seem to spring from a common centre, a circumstance which suggests at once that the ornament formed part of a great headdress. Each of the seated figures would seem to have been provided with a great plume upon the headgear. These plumes took different shapes. Plate XIII, F is a side view of a curved plume measuring three feet across

from the spring of the feathers to the tips. Plate XIII, G is a top view of another great plume which forms a right angle sixteen inches above the point where it was attached to the headdress and extends backward a distance of three feet. On Plate XV is shown another plume in side view. It is somewhat smaller than those already mentioned, but the graceful sweep of the plumage is particularly well illustrated in this example. Beside it on Plate XV is shown a front view of another similar plume of more slender dimensions. The fragment, Fig. 8, measures seven feet horizontally.



FIG. 8. — SERPENT ORNAMENT, PARTLY RESTORED.
Compare Plate XIII, A.

There is no doubt that the rattlesnake plume rose above and completed the headdress on the figure seen in Plates VI and X. The serpent heads seen on either side of the monstrous jaws forming the headpiece of that figure are the heads of the rattlesnakes on the plume. A portion of the body of one of these snakes can be seen curved over the dragon's head on Plate X. It may be observed that the body of each serpent after forming the loop, seen in Fig. 8, is twisted in such a way that the back of the animal is always turned outward. If the bodies formed several consecutive loops after the manner of the Caducean serpents, and they apparently may have formed at least two complete loops in order to take the shape seen in Plate X, they would have to be twisted once in the formation of each loop, in order to make all the loops symmetrical.

Two pairs of serpent heads of the conventional type were found among the ruins of the stairway. The figure of the "long-nosed god" appears emerging from the open jaws of each of these heads (Fig. 9). The two pairs are similar in every respect.

Another notable ornament is the great head (Plate XIII, S). Two other heads similar in every respect were found near this one, not underneath the landslide, but on the level ground a few feet in front, where they were buried among other fallen stones and vegetable mould. The position in which they were found leads me to believe that their place was on the façade of the building above the stairway. In the same vicinity were

found fragments of several pairs of great claws—clearly representing those of some bird of the parrot family. The presence of these claws, which correspond very well with the heads in proportions, would seem to do away with any doubt that might exist respecting the identity of the heads themselves. Each head and each pair of claws belonged very likely to the same sculpture which represented a gigantic parrot or macaw. The head bears a striking resemblance to the sign for the month Kayab in the inscriptions. Compare especially back of Stela B, Copan, 1st glyph. The resem-

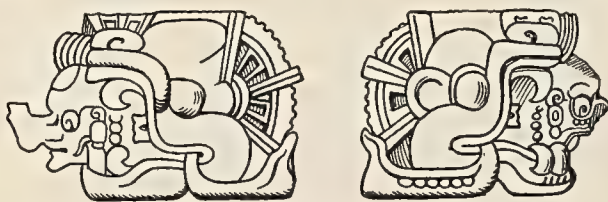


FIG. 9.

blance is so striking as to offer a very strong suggestion that the month Kayab in the inscriptions is represented by the head of a parrot or macaw and not the head of a turtle. Wherever the turtle is represented in the sculpture the head is not at all like this. Neither the west altar of Stela C at Copan nor the great turtle at Quirigua, to give two well-known examples, has a head with any resemblance to the symbol for Kayab. In the Ball Court Temple at Chichén Itzá forming part of the wall sculpture is a turtle, the head of which is altogether different from the symbol for Kayab (see Maudslay, Vol. IV, Plate 93, o). On the other hand, it is true that in the Codex Peres. is seen a turtle with a head quite similar to the sign for Kayab as drawn in the manuscripts.

The sculpture shown on Plate XIII, V has the same shape and dimensions as the bird symbol of the balustrades (one of which is shown in W, Plate XIII), and may have taken the place of one of these. The heads with which this stone is ornamented are similar to the head in the day sign on step L 1, Plate VI. Compare also Plate XIII, K and L. The animal represented by this head is not recognizable. It differs from the tiger's head which always shows spots as well as a tusk. See Plate VI, G 8, and Plate XIII, C, 1st glyph, and E, 3d glyph.

The sculpture shown on Plate XIII, U is the under side of the last block in step D, Plate V. The block is cut from an older monument of some sort containing an inscription. The sculpture resembles that on X and Y, two stones found in different parts of the ruins.

On Plate XIII, T is shown a fragment of sculpture found near the summit of the mound, and, as would seem probable, formed part of a hieroglyphic frieze running round the temple.

THE INSCRIPTION.

THERE is one thing not discussed in the foregoing description of the Stairway, because of the absence of definite evidence bearing on the subject. I refer to the impression received while at work on the ruins of the structure, that all the parts were placed in position before they were sculptured. This does not of necessity mean that the whole stairway with its ornaments and accessories was built right up to the top before the sculpture was begun. This is perhaps improbable. At any rate, it is almost certain that each part was placed in position in the rough, and carved afterwards. The altar at the base, the seated figures, the ornamented balustrades, and the steps themselves, all were carved as it would seem *in situ*. It is easier to conceive of the nice adjustment of the adjacent parts having been achieved in this way. Where the lines of the sculpture intersect the joints in the stonework, there is no evidence of the disagreement or disproportion which would be more likely to occur if the stones were carved separately and placed in position afterwards.

More convincing than this, is the evidence in the carving of the glyphs at either end of the steps, which is never so deep or quite so finished as on the remainder of the step. It deepens gradually from the ends, and usually attains its normal depth between the first and second glyphs. There would be no apparent reason for this if the blocks were carved before they were placed in position, but it is easily understood if we suppose that the workmen were at the disadvantage that would be occasioned by the closeness of the balustrades, interfering with their work. There is nothing contrary, therefore, to the supposition that the carving of the inscription was done in the same order in which it is to be read, that is to say, from top to bottom, and that the top step with the beginning of the inscription was the first that was carved, and the lowest step with the end of the inscription was the last executed.

The incompleteness of the inscription, and the imperfect condition or entire obliteration of many of the glyphs in the part that remains, make it a less satisfactory subject for study than most of the long inscriptions at Copan, Quirigua, Palenque, and Piedras Negras. In most of these the initial series as well as many other time reckonings have been deciphered, and the texts are sufficiently legible not only to render the reading unequivocal, but to determine beyond question the significance of the reckonings in relation to a rigid chronological scheme. Even in cases where some of the glyphs are illegible or of unfamiliar form, these glyphs have been restored in the one case and their proper respective meanings assigned to them in the other, by means of the context.

For the reasons already stated, we cannot expect to obtain results so satisfactory in all respects from the inscription on the Hieroglyphic Stairway, and it is not unlikely that the results obtained by others will differ in some respects from those given here. Nevertheless, some very interesting facts appear from an inspection of the glyphs and some interesting problems present themselves.

The notation used in the following discussion is that adopted by Bowditch, which differs from that introduced by Goodman in having 0 instead of 20 in connection with the Katun, Tun, and Kin, and instead of 18 in connection with the Uinal. The numeration assigned to the Great Cycle period by Goodman is made use of, although this is not generally considered settled. The question of its correctness does not affect in any way the calculations made or the results obtained.

Goodman's tables are used in all the operations.

Turning to Plate VI, we have on step A the continuation of the broken inscription, without knowing what came immediately before. It will become evident, from our examination of the inscription, that the order of reading is from the top downward, from left to right along the faces of the steps.

DATE I.

Passing over the first three steps, on which most of the legible glyphs are unknown, we find on step D an initial series beginning at the left and reading as follows:—

- D 1. Great Cycle 54.
 D 2 a. Cycle 9. The head which represents the Cycle is characteristic, and does not differ in any material respect from that which stands for this period in many of the inscriptions.
 D 2 b. Katun 5. Here we have the familiar Katun sign. The numeral above it, if we compare it with the bar representing 5 over the Cycle sign or with the two upright bars in L 1, will appear to be undoubtedly 5.
 D 3 a. Tun 19. The familiar Tun sign surmounted by 3 bars and 4 dots. Two of the dots are broken away, but comparison with the same numeral in other inscriptions show that we are perfectly justified in reading this as 19.
 D 3 b. The familiar Uinal sign surmounted by a numeral that looks unfamiliar. This numeral is partly effaced, but parts of it are still clear enough. At the top can be distinguished either one, two, or three dots. Below this appears a sign, the left end of which is a sort of annular object.

On Plate XII, L, 6th block, are two glyphs, the first of which, though only half of it remains, is seen to be the last of the initial supplementary series with the number 9 below; following it is the sign for the month Mol with the

sign  over it. A comparison of this sign with that over the Uinal in

D 3 b will show that the two are very much alike.

On Stela C at Copan, north side A 3, over the sign for the month Cumhu occurs

the following  The lower part of this sign, with slight variations,

occurs often in the inscriptions, usually in connection with numerals or in positions where it would seem to have a numerical value. Among other instances may be mentioned on the north side of the great turtle at Quirigua, where it occurs as in Fig. 10 over the sign for the month Zotz, and again as

follows  over a sign which has been erased from the stone.

Goodman has already assigned the value 18 to the numeral on Stela C shown a short distance back. This would give the lower part of the sign the value 10. There would seem to be some doubt about the case, however, for the meaning of the text is not clear. Supposing however that this is the correct value, the numeral on Plate XII referred to, would then have the value 12, and the one on step D 3 b would represent either 11, 12, or 13.

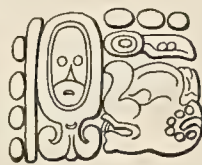


FIG. 10.

- D 4 *a*. Kin 0. The face sign for this period does not show any new features. The numeral above it looks like 0, and the day shows that it must be zero.
- D 4 *b*. Ahau. The numeral above the day sign is not clear, but it is not less than 5 or greater than 10.
- D 5, 6, 7, 8, and 9 *a* are supplementary glyphs. The last of these, though badly effaced, may be recognized as the last of the supplementary series with number 9 below.
- D 9 *b* is the month glyph, and it looks most like Mac, though it might be Chen. The numeral above seems to be 3, and indeed it can be no other, for 54.9.5.19.0.0 gives 13 Ahau 3 Pop, and since the beginning day of the Tun is the third of the first month, and there are no odd days, the required day must be the third of some month, no matter what the Uinal count is.

Giving the Uinal all possible values from 0 to 17, we get the following list:—

54.9.5.19. 0.0	13 Ahau 3 Pop.
54.9.5.19. 1.0	7 Ahau 3 Uo.
54.9.5.19. 2.0	1 Ahau 3 Zip.
54.9.5.19. 3.0	8 Ahau 3 Zotz.
54.9.5.19. 4.0	2 Ahau 3 Tzec.
54.9.5.19. 5.0	9 Ahau 3 Xul.
54.9.5.19. 6.0	3 Ahau 3 Yaxkin.
54.9.5.19. 7.0	10 Ahau 3 Mol.
54.9.5.19. 8.0	4 Ahau 3 Chen.
54.9.5.19. 9.0	11 Ahau 3 Yax.
54.9.5.19.10.0	5 Ahau 3 Zac.
54.9.5.19.11.0	12 Ahau 3 Ceh.
54.9.5.19.12.0	6 Ahau 3 Mac.
54.9.5.19.13.0	13 Ahau 3 Kankin.
54.9.5.19.14.0	7 Ahau 3 Muan.
54.9.5.19.15.0	1 Ahau 3 Pax.
54.9.5.19.16.0	8 Ahau 3 Kayab.
54.9.5.19.17.0	2 Ahau 3 Cumhu.

It will be seen that only one of these dates agrees with the conditions which were derived from our inspection of the glyphs. The one which fulfils in all respects these conditions is,—

54.9.5.19.12.0 6 Ahau 3 Mac.



FIG. 11.



FIG. 12.

Fig. 11 is D 3 *b* restored, and Fig. 12 is a restoration of D 9.
This date would seem to confirm Goodman's conjecture respecting the value of the month numeral in the initial date on the north side of Stela C.*

* Dr. Seler regards this date on Stela C as the normal date, 4 Ahau 8 Cumhu; in which case the sign immediately above the month symbol would be apparently without significance. An inspection of the stone convinced me that the Ahau number is not less than 5.

On this same step, 15, 16, there seems to be a distance number made up of Kins, Uinals, Tuns, and Katuns, but the numerals are all past recognition. In 19 are seen the day and month signs. The head in the day sign is somewhat injured; the month is apparently Chen. The numerals are not legible.

DATE II.

Step E begins with another initial series, as follows:—

- E 1. Great Cycle. The central superfix of the Pax sign is erased, and there is really nothing by which to identify the glyph, but it is probably the one called the 54th.
- E 2 a. Cycle 9.
- E 2 b. Katun 7 or 8. The Katun sign, unlike that in step D, is a head.
- E 3 a. Tun. The head which stood for the period is almost obliterated, and the numeral is entirely so. The position shows it to be the Tun.
- E 3 b. Uinal. Only the great curved tooth can be distinguished in the head. The numeral is very indistinct, but its value is greater than 5.
- E 4 a. Kin. Here an unusual thing occurs; the Kin number, instead of being represented by bars and dots placed above the head representing the Kin, is represented by a symbol in which a small head appears. This symbol is placed above, and takes the place of the bars and dots seen in the other period glyphs. The face seen in this numeral has the large ear ornament often associated with both the 1 face and the 8 face. The number cannot be identified at present by simple inspection. In the Kin face itself there does not appear anything unusual.
- E 4 b. Chicchan. The day sign here is very clear, and I take it to be Chicchan. Compare Plate XII. J, second block, 1st glyph, and K, 1st glyph. The first of these I take to be Cimi and the other Chicchan. The day being Chicchan, the unfamiliar Kin numeral must be 5. The day number is not legible.
- E 5 a. It appears doubtful at first whether this is the month sign, or whether the month sign is to be found in 8 a. The head in 5 a is not very clear, but it cannot be said to resemble any month sign. The head in 8 a is not clear, but it may well be Mac or possibly Chen. The superfix is especially like that of Mac, and the symbol itself is in all probability the fish head that usually stands for that month in the inscriptions.* The number above it is 8.

We have therefore as the probable date, as far as we have been able to make it out:—

54.9.7 or 8.???.5 ? Chicchan 8 Mac.

If we suppose the date to be in the 7th Katun, and give the Uinal all possible values above 5, we get a list of dates in which Chicchan does not appear as the 8th of Mac. But if we suppose the date to be in the 8th Katun, and give the Uinal all possible values above 5, we get a list in which two satisfy the conditions, and we get as the probable date:—

54.9.8.8.6.5 7 Chicchan 8 Mac.
or 54.9.8.12.7.5 11 Chicchan 8 Mac.

* That a fish head is intended seems likely from the resemblance of the symbol to the heads of fishes in various sculptures. See Copan, Stela A, west side C 8, where there is a fish, and, underneath it, the sign which is used as a superfix for Mac in the inscriptions, and which might well represent a pair of fins. See also Stela C, initial glyphs; Stela D, initial glyph, and Stela N, north side above headdress.

The former is the more probable, since the day number is more like 7 than 11.

54.9.8.8.6.5 7 Chicchan 8 Mac.



FIG. 13.

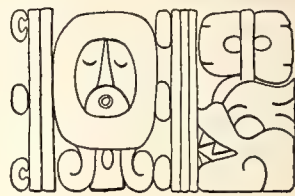


FIG. 14. — 11 AHAU 18 MAC.
Date on a small circular stone
from Copan.

Fig. 13 is E 8 *a* partly restored.

DATE III.

On step F is another initial series, but the numerals are all illegible : —

- F 1. Great Cycle (probably 54th).
- F 2 *a*. Cycle (probably 9th).
- F 2 *b*. Katun (number above 5 and resembles 9).
- F 3 *a*. Tun (number seems to be above 10).
- F 3 *b*. Uinal (number seems to be above 10).
- F 4 *a*. Kin (glyph and numeral illegible).
- F 4 *b*. Day sign (either Kan or Cib, numeral not legible).

Following this is the supplementary series. F 5 is not clear. Compare F 6 *a* with D 6 *a*, and F 6 *b* with E 6 *a* and D 6 *b*. F 8 *b* is the last of the supplementary series, and F 9 *a* is the month sign Kayab, with the numeral 17. This shows the day to be Kan and not Cib, for the latter cannot be the 17th of a month. The Kin number must therefore be 4, and the probable date so far as made out would be : —

54.9.9??.?.4 ? Kan 17 Kayab.

If we suppose the date to be in the 9th Katun, and if we regard the Tun and Uinal numbers as being above 10, we have a choice between two dates : —

54.9.9.14.17.4 5 Kan 17 Kayab.

54.9.9.18.18.4 9 Kan 17 Kayab.

The first of these would seem to be the more probable, since the day number looks more like 5 than 9 : —

54.9.9.14.17.4 5 Kan 17 Kayab.

Passing over the next four steps and taking up step K, we find in K 1 *a* an unknown head (compare D 20 *b*). K 1 *b* is a cartouche supported on a tripod with a numeral over it. It has every characteristic of a day sign ; the head is too much disfigured to be identified, but it would seem as if it might be a head with a long scroll projecting from the mouth and turned up in front of the face. K 2 *a* is not legible ; K 2 *b* is a head, but is not at all clear. It is possibly the month Muan.

3 *a* is a familiar sign of unknown significance. From 3 *b* to 4 *b* inclusive is a distance number made up of Kins, Uinals, Tuns, and Katuns. Only the Kin number is clear. The cast shows the Uinal number to be 9, the Tun and Katun numbers cannot be recognized, but the Tun number is certainly above 5, but not above 10, and the Katun number is above 10, but not above 15. 5 *b* has every characteristic of a day sign, although the head does not look familiar. The day and month date corresponding to the number in K 3 *b*-4 is possibly in K 1 *b*-2, preceding the number, but may it not be that K 5 *b* is the day sign, and the corresponding month sign is L 20 *b* = Zotz? Is the number to be counted from the initial date beginning on K 16, or from some other date?

Naturally we would expect to find a month sign in K 16, if the order of the reading is from K 5 to K 16, but in L 1 if the reading is K 5, L 1, etc. In neither place, however, do we find a month sign.

DATE IV.

Coming to K 16, it is clearly seen, notwithstanding the condition of the stone, that this glyph is the beginning glyph of an initial series. At the lower part the outline of the Pax symbol is distinct, as is also the comb-like flank on the left above. All else is obliterated.

- K 17 *b*. The Cycle.
- K 18 *b*. The Katun.
- K 19 *b*. The Tun.
- K 20 *a*. The Uinal.
- K 20 *b*. The Kin.

The Cycle, Katun, and Tun signs are not very clear, but by comparison with those in other inscriptions they can all be recognized. The Uinal is at once recognized by the characteristic curve and the Kin head is very similar to the heads which stand for the same period in other inscriptions.

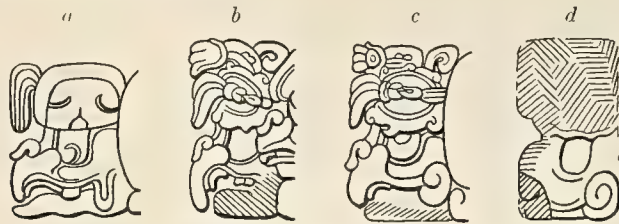


FIG. 15. — *a*, TEMPLE OF THE SUN A 8. *b*, PALACE STEPS A 3.
c, PALACE STEPS C 4. *d*, HIEROGLYPHIC STAIRWAY K 18 *a*.

Returning to the Great Cycle glyph, there is nothing to show what place it occupies in the scale of numeration we have adopted, and we must pass it over as unknown for the present. The number attached to the Cycle, being entirely effaced, must be passed over also as unknown. The Katun number, represented by the face 18 *a*, is not easily recognized. Two things may, however, be noticed about this face: first, the great curved tooth at the back of the mouth, characteristic of the Uinal head; second, the distance between the bottom of the head and the eye is small in proportion to the entire height of the head. Now, these two things are marked features of the face representing 13 in two conspicuous instances. In the Temple of the Sun at Palenque, A 8, is

a head known to stand for 13 (Fig. 15 *a*). This face not only has the curved tooth like the Uinal head, but on the high upper portion of the head is displayed the ordinary Uinal sign. Again on the Palace steps at Palenque C 4 is another head for 13,* in which the curved tooth is still more fully developed, and on the high upper portion of the head is an ornamental headdress (Fig. 15 *c*). Nothing definite can be distinguished above the eye in step K 18 *a*, but the distance is in itself significant. However, these indications are not sufficient to identify the Katun number, and we pass it for the present as unknown.

The Tun number 19 *a* is also represented by a face, and this too is far from being clear. There are certain markings near the mouth that look like the dots that serve to distinguish the 9 face, but as they are very faint and ambiguous they cannot be relied upon. There seems to be a marked resemblance between this face and that in step A 4 *a*, and this offers another suggestion in support of its being a sign for 9.

A 4 *b* consists of an extended hand with thumb pointing upward, supporting a head. The head in this case is very much like one which occurs often in the inscriptions and ornamental carvings, and under the name of the head of the "long-nosed god" and

other appellations has been identified with one occurring frequently in the codices. In the sculptures it seems to have two forms or variants. One of these is always distinguished by the square cross on the forehead, and when this form has a known number attached, that number is always 7 (Fig.

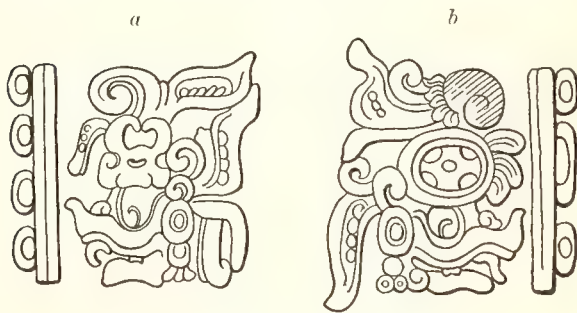


FIG. 16. — FROM STELA D AT COPAN.



FIG. 17. — STELA 1, COPAN, EAST B 4.

16 *b*). The other form, the one which resembles the face in A 4 *b*, is without the cross, and when it has a known number associated with it, that number is always 9 (Fig. 16 *a*).† Moreover the outstretched hand sometimes occurs in the inscriptions supporting a head which has been called the North Star; and wherever I have seen this combination, it takes the number 9 (Fig. 17).‡

Now in step A 4 *a* is this particular form of hand supporting a head very much like one which, so far as our experience goes, always takes the number 9 when it takes

* Goodman has given the reading of this date as 55 . 3 . 18 . 12 . 15 . 12 . 8 E b 15 Pop; but I think there can be no doubt that it reads 54 . 9 . 8 . 9 . 13 . 0 . 8 Ahau 13 Pop, as Seler has stated.

† For examples of this form see especially Copan, Stela P, north A 9. Altar R, 12. Stela D, north A 6. Stela D, west side, and Step in Temple 11, 9; also Palenque, Temple of the Cross under left figure, and Temple of the Sun to right of shield. For examples of the other form see Copan, Altar T, south side 1 *a*. Stela D, east side, and Temple of the Sun, Palenque, to left of shield.

Since this Memoir went to press I have seen *Die Alten Ansiedelungen von Chaculá* by Dr. Seler of Berlin University. In this work the author calls attention to the association of 9 and 7 with the two variants of this face. He also refers to the *Zeitschrift für Ethnologie* for statements in the same connection. When this paper was written, I was not aware of Dr. Seler's studies in this connection. He regards the face shown in Fig. 16 *a* as the face of the Watergod, and, following Förstemann, he calls the sign seen on the forehead in Fig. 16 *b*, the symbol for the planet Venus.

‡ See Copan, Stela I, east A 5 and north B 7. Stela 1 B 4 and Hieroglyphic Stairway, Plate XII, E 2.

any number. If therefore the face in this case represents a number, we have strong reasons for believing that number to be 9. This of course is far from conclusive regarding the value of the face in K 19 *a*, for the identity of the two faces cannot be proved. We must pass this number as unknown for the present. It may be worth while in this connection to compare Plate XIII, R. Here is seen a similar combination without any numeral, but curiously enough it is preceded by the last of the supplementary series with the number 9.

The Uinal and Kin signs, as we have seen, are crowded into the last square on the step, and their numbers are represented by the bar and dot method. The Uinal number is 14, and the kin number is 9.

If the inscription, after passing step H, is to be read down the left side of the altar, and continued on the right, or vice versa, for that matter, we should expect to find the day sign in L 16; but there is nothing at all in this glyph that looks like a day sign. If, on the other hand, the inscription is to be read from one end of each step to the other, down to the bottom step, then we must look for the day sign in L 1, and sure enough this glyph has every characteristic of a day sign. The head is not at all familiar as a day sign, although the same or a similar head is common enough in the inscriptions where its meaning is not known.

The day number is 12, and the day itself can be no other than Muluc, since the Kin number is 9.

The next thing to do is to find the month sign, which is not so easy, because the month signs are not so clearly distinguished by their form as the day signs, nor is the position of the month sign relative to the day sign by any means constant. Two things are recognized, however, as determining the position of the month sign in the initial dates. Either it comes immediately after the day sign, or else it follows the supplementary series, consisting of from six to nine glyphs. In this position it can be recognized, in the great majority of cases at least, by the last of the supplementary series, the form of which is pretty constant.*

L 2 is plainly not the month glyph, and passing over the succeeding glyphs, we recognize in 18 *b* the last of the supplementary series, as may be seen by comparing it with F 8 *b*. Following it in 19 *a* we should ordinarily expect to find the month glyph. What we find, however, is a glyph which, though not at all clear, has little resemblance to a month sign. It perhaps looks a little like Kayab, but the likeness is remote, and moreover no numeral appears in connection with it. We know that the month sign we are in search of must have one of the numbers 2, 7, 12, or 17 attending it. It must be concluded that 19 *a* is not the month sign. The last glyph on the step has the appearance of a month sign, but the sign for the month is never found so far removed from the day sign.

Coming back to our starting-point, we find in 3 *b* the sign for the month Muan, attended by a face, 3 *a*. This must be the sign we are in search of, and if so the face 3 *a* represents either 2, 7, 12, or 17. It will be necessary to determine the value of this numeral before proceeding any farther, and on this everything will now depend. The jaw is not a skeleton jaw, and therefore the two higher numbers are eliminated, leaving 2 and 7 to be decided between.

I know of only one face sign for 2. It is in the initial series on Lintel 2 of Piedras Negras, and Bowditch has shown its value to be 2. A comparison of this

* See statement on page 5 of *Notes*, by Charles P. Bowditch, on the report of Teobert Maler in *Memoirs Peabody Museum*, Vol. II, No. 1. Both d. and m. may follow supp. s., v. St. 1 and 10, Cop.

glyph and L 3 a shows no similarity between them, and this leads us to the conclusion that the number must be 7.*

The results obtained by inspection from the initial series beginning on K 16, contained in the preceding paragraphs, may be summed up as follows:—

Great Cycle (number unknown).
 Cycle (number unknown).
 Katun (number unknown, but indications point to 13).
 Tun (number unknown, but indications point to 9).
 Uinal 14.
 Kin 9.
 12 Muluc 7 Muan.

Counting back 14 Uinals and 9 Kins from 12 Muluc 7 Muan, we come to 9 Ahau 3 Uayeb, the beginning of the Tun.

Now we shall have to make the assumption that the Great Cycle is the one that we have been calling the 54th. The justification for doing this consists in the knowledge that all known dates at Copan, and almost all those in the other localities where similar inscriptions are found, begin in this way. This is the only assumption made. We look first in the 9th Cycle of 54th Great Cycle, because we are accustomed to find most of the dates in this place. The date 9 Ahau 3 Uayeb is the beginning day of the beginning Tun of the 6th Katun. This is manifestly not the date wanted, for it seems clear that the Tun number is not zero. The face sign for 0 has a hand on the lower jaw (Fig. 18). The Katun number is not like 6. All the known face signs for 6 have the hatchet eye, and this would seem to be a constant distinguishing feature of the numeral (Fig. 19).



FIG. 18.—STELA 1, COPAN, EAST A 4.



FIG. 19.—TEMPLE OF THE SUN, A 7.

The next place where the date 9 Ahau 3 Uayeb occurs is in the 11th Cycle, and it begins the 9th Tun of the 13th Katun.

The date occurs altogether five times in the 54th Great Cycle:—

54. 2. 3. 13. 0. 0
 54. 4. 11. 2. 0. 0
 54. 6. 18. 11. 0. 0
 54. 9. 6. 0. 0. 0
 54. 11. 13. 9. 0. 0

The last of these is the only one that does not seem to be contradicted by the Katun and Tun numerals, and moreover it corresponds exactly with what was observed in our inspection of these numerals, and we may without much hesitation write down the date as:—

54. 11. 13. 9. 14. 9 12 Muluc 7 Muan.

* Compare Quirigua, Stela D, east A 7 (numeral of the day Ahau).

In Fig. 15 is shown a drawing of 18 *a* together with drawings of the face signs for 13 in the Temple of the Sun inscription, and on the Palace steps.

The position of the month glyph in this initial date, though unusual, is not singular. The inscription in the Temple of the Sun at Palenque has the month glyph in the same position; that is to say, the month sign in both of these inscriptions comes in the second place after the day sign.

The Kin number in K 3 *b* is clearly 10, and therefore if the period, whatever it is, expressed in this glyph and the next be added to or subtracted from the initial date on step K, the resulting day will be Cauac. This may be of use in identifying the day sign in K 5 *b*. The cast shows the numeral above this day sign to be either 7 or 8, probably the latter. If we suppose the period in K 3 *b*-4 to read —

14.7.9.10

which is not unlikely (see page 25), and if we subtract this period from Date IV, we come to a date in which the day numeral corresponds to that seen in K 5 *b*, and the month to that in L 20 *b*.

54.11.13.9.14.9	12 Muluc 7 Muan
14.7.9.10	
54.10.19.2.4.19	8 Cauac 12 Zotz (Date IV <i>a</i>)

The value of the numeral with the month Zotz in L 20, is not revealed by inspection.

On Plate V is another fragment of the inscription. This fragment begins abruptly in the middle of a step. It will be remembered that these steps had fallen in a body, and it should be said that while their relative positions were preserved, yet when only a portion of a step remained, it was not always possible to tell the *exact* position of that portion in the step itself.

There is nothing, however, with the exception of the first step, which is doubtful, that is not approximately in its right position. To make this clear, it will be best to take up each step separately.

Step A. Only the first block was found in this position; the others were found near the bottom of the slope among the débris. The first joint comes in the middle of the second glyph, and it is evident that this part of the restoration is all right. The second joint, however, falls between the halves of the fourth glyph, and it may be questioned whether these two blocks belong together. The third joint falls on the blank space between the fifth and sixth glyphs, and this also may be questioned. The fourth and last joint intersects the seventh glyph in such a way as to leave no doubt concerning this part of the restoration. It will be seen that from the middle of A 12 to the end of the step the glyphs may or may not belong in this position. They were photographed so because the blocks seemed to fit each other fairly well, and to fill up the space in the step.

Step B. These four blocks are shown as they were found, but it is impossible to say that they occupy their exact position in the step. This must be regarded as approximate.

Step C. In this case there is no doubt that the two portions of the step are in their proper positions.

Step D. This is especially an interesting step. The first part is in its right position, as is evident from the condition in which it was found. The third block, the one with the lower part of the figure and a portion of the next glyph were found among

the débris below and replaced. There can be no doubt about the correctness of this restoration. After this a portion of the step is missing, but a smaller portion than at first seemed to be the case. It was not until after the plate was made and I had begun to examine the glyphs in detail and it was too late to make a correction, that an error in the arrangement of the latter part of step D became apparent. This portion of the step consists of two blocks, the first of which is broken in two in the middle of D 11. The smaller portion of this block was found at the bottom of the slope. The other piece of the block was found farther to the left than shown in the plate, leaving a space between it and the next block which occupied about the same position, relative to the extreme right, as in the plate. But as it was evident from the sculpture that the two blocks had occupied adjacent positions, they were brought together in the position seen in the photograph, making the joint which appears in D 13. It is evident now, as will appear later, that this portion of the step is placed too far to the right, and the glyph which appears as D 10 is really D 8, and nothing is missing in the middle of the step except the latter half of D 7 and the first part of D 8, while two glyphs besides the one of which a portion remains are missing at the end to the right.

Step E. This step is complete with the exception of a small fragment of the last glyph. It consists of four blocks, not counting the space in the middle occupied by an independent sculpture. The first joint falls on the fourth glyph. The joint between the other two blocks falls between E 13 and E 14. The last block is broken in two, and the last half of this block is the only part of the step not found in position. Measurement will show that the central sculpture occupies the space of just three of the average glyphs on the step. The same is true of the next step, F. On the left of the figure are six glyphs of regular size, and one that occupies only about half the space of the others; we may say seven glyphs. On the right also are seven glyphs. This makes the whole length of the step equal to seventeen glyphs, which is the number it would contain if they were continuous from one end to the other. This is also true of step F. Returning now to step D, measurements will show that the prone figure following the third glyph occupies exactly the space of three of the average glyphs on the same step. Taking this in connection with what has been observed of steps E and F, we may conclude that there were seventeen glyphs on this step also, or rather fourteen glyphs besides the prone figure, which is equal to three. Of these fourteen only twelve remain (three of these twelve are represented by portions only). The two missing glyphs are D 16-17, which ought to be shown in blank on the plate, as will appear presently.

DATE V.

On Plate XII, E is seen a figure very much like the one in step D. It is followed by a glyph which in its composition resembles very closely a Great Cycle glyph, or the beginning glyph of an initial series. It differs from the known Great Cycle glyphs in the nature of the central superfix of the Pax sign. This element, usually a head, is here a form of the Kin sign.

DATE VI.

Comparing this glyph with that which immediately follows the prone figure on step D, it will be seen that the remaining portions of the one are almost identical with the corresponding portions of the other. Unluckily, the glyph on step D is broken away almost in the middle, and the small portion of the central superfix that remains

is not clear enough to show whether or not it is the same as that in the glyph to which reference has been made. An examination of the cast leads to the conclusion that it is probably not the same, but that it is in this case a head. This is not certain, however. An examination of the fragment of a glyph that appears in D 10 shows it to be a head with a hand on the lower jaw, the mark of the Cycle sign. I will therefore call this glyph D 8, and those following it will be referred to as 9, 10, 11, 12, etc., instead of 11, 12, 13, 14, etc. In D 9 *a* the symbol can no longer be recognized, but the position shows it to be the Katun. In 9 *b* is a head which, though not very clear, is seen to resemble the Tun head in a number of inscriptions. In 10 *a* is seen the curve of the Uinal head, and the Kin head in 10 *b* resembles especially the head representing the same period in Quirigua, Stela A, Initial Series; Stela C, east side, Initial Series; Stela E, east side, Initial Series, and Piedras Negras, Stela 1, Initial Series.

Returning to the numbers of the periods, we are obliged to pass over the numeration of the Great Cycle and Cycle as unknown. Coming to the Katun number, although the numeral is somewhat injured, it seems quite plain that there are three bars above, and the number is 15. The Tun number is not less than 10 nor greater than 15. Nothing more definite than this can be determined by an inspection of the numeral. The Uinal number is 10, and the Kin number is 10.

In 11 *a* is a day sign which looks like Oc. It is clear that it must be Oc, since there are 10 odd Kins in the count. The day number is 11.

In 11 *b* and 12 nothing like a month sign appears. In 13 *b* is a sign that looks something like the last of the supplementary series, but no numeral appears with it. If 11 *b* counts as two, and 12 counts as two, and 13 counts as two, then we have a series of six glyphs, followed in 14 by one that looks like the sign for the month Cumhu, having in front of it what might be taken for the numeral 3. I feel confident, however, that this is not the month glyph. Keeping in mind that two glyphs are wanting at the end of the step, it seems plausible at least that the supplementary series in this case extended from 11 *b* to 17 *b* inclusive. My reason for regarding 17 *b* as the last of the supplementary series is that on step E 1 is what I believe to be the month glyph corresponding to the initial series on step D.

The value of the face numeral in E 1 *a* is not at first sight apparent.

The day Oc requires that it be either 3, 8, 13, or 18. The skeleton jaw shows that it is not below 10, and 13 and 18 are left to choose between. Except in the matter of the jaw the face resembles the 3 face most closely. The resemblance to the face in the Temple of the Sun A 6 is very marked. The band about the head in the two cases is strikingly similar. The frontal in E 1 *a* is too much injured to admit of comparison, but the resemblance of the two heads is so strong that I feel justified in the inference that the face in E 1 represents 13, being the 3 face increased in value by 10. This is in keeping with the methods of the Mayas, as may be seen by comparing the 6 face with the 16 face, for example.

The results of our inspection of this initial series are then as follows: —

Great Cycle (number unknown).
 Cycle (number unknown).
 Katun 15.
 Tun 11, 12, 13, 14, or 15.
 Uinal 10.
 Kin 10.
 11 Oc 13 Pop.

Counting backwards from 11 Oc 13 Pop 210 days brings us to 3 Ahau 8 Chen, the beginning day of a Tun which we know to be the 11th, 12th, 13th, 14th, or 15th Tun of the 15th Katun of some Cycle of some Great Cycle. Going to the 9th Cycle of the 54th Great Cycle to make the first trial, we find that no Tun of the 15th Katun begins with this date. In fact, no Tun within the above-mentioned limits in the 15th Katun of any cycle of the 54th Great Cycle begins with this date. If I am right in regard to the period numbers, this date does not fall within the Great Cycle beginning with 4 Ahau 8 Cumhu. Where does it fall?

If the date reads —

15 . 15 . 10 . 10 11 Oc 13 Pop.

it can come only in the 9th Cycle of the Great Cycle beginning with a day 4 Ahau 13 Uo, which is the 62d in Goodman's scale of numeration.

If the Tun number is 14, the date is in the beginning cycle of Great Cycle 72, and giving the Tun number all values from 11 to 15, we get the following dates: —

72.	0.	15.	14.	10.	10		11 Oc 13 Pop.
62.	9.	15.	15.	10.	10		" "
26.	12.	15.	11.	10.	10		" "
17.	8.	15.	12.	10.	10		" "
8.	4.	15.	13.	10.	10		" "

All of these look absurdly remote from what we would expect.

Following the month glyph in E 1 come a number of glyphs all of which look familiar enough, though their meanings are not known. In E 12 appears a distance number made up apparently of 5 Kins, ? Uinals, and 6 Tuns, — assuming that the bar placed before the Uinal sign stands for the Kin number. The upper corner of the step is somewhat worn, and the Uinal numeral, if placed above, has entirely disappeared. It would seem, however, as if the Uinal numeral had been placed at the right of the sign for that period for lack of space above. This numeral looks like 1, and the number may be read: —

6 . 1 . 5.

E 13 *a* is a head of unknown meaning; compare with F 1 *b* and Plate VI, K 5 *a* as to form and position. 13 *b* is a day sign and 14 *b* is the month Pop. The suffix of Pop looks the same as in E 1. 14 *a* is a head surmounted by a sign, which may also be a head, but which is not at all clear. The month numeral must be expressed in 14 *a*, for there is no space above for a numeral. The face in 14 *a* may stand for 8. It looks very much like 8, although the 8 and 1 faces look so much alike that it is often difficult to distinguish between them.

The numeral over the day sign in 13 *b* is not clear, but it is a high number, surely above 10.

If the distance number is 6. 1. 5 = 2185, and the date is forward from 11 Oc 13 Pop, it is 12 Men 8 Pop, which corresponds very well with the date in E 13-14.

Of course it may be argued that the Kin count is given in E 12 *a*, and not in the bar at the left of the Uinal sign. Compare the text in this place with that on B 10-11, where the number is clearly 11. 9. 9.

The face above the supposed Kin sign in E 12 *a* is not very clear, but it looks very much like a 10 face. A row of teeth is distinctly seen, as well as the skeleton jaw.

Compare face in Fig. 20, 9th glyph, where we have the familiar date 6 Caban, 10 Mol. Now, if we adopt this reading, we get a curious result:—

$$6.5.10 = 2270.$$



FIG. 20.—INSCRIPTION ON THE FOUR SIDES OF A SMALL STONE TABLE FROM COPAN.

Counting forward this number from 11 Oc 13 Pop, we come to 6 Ahau 13 Tzec, a date that is not found on step E. But in F 2 is found a date, an inspection of which, even in its mutilated condition, will show it to be 6 or 8 Ahau 13 Tzec. It would seem, therefore, as if there were two collateral numbers in E 12 (Fig. 22), each of which is to be added to the initial series on step D.

Initial date + 6.1.5 is 12 Men 8 Pop (Date VI *a*).

Initial date + 6.5.10 is 6 Ahau 13 Tzec (Date VI *b*).

If the text will bear this construction, we have double assurance that the preceding date is 11 Oc 13 Pop, and I can see no reason why this should not be the construction intended.

In this connection it may be interesting to compare a date on the hieroglyphic bands at the base of Stela N (Fig. 23), which may be 11 Oc 13 Pop.



FIG. 21.—DATE ON TOP OF TABLE HAVING THE INSCRIPTION SHOWN IN FIG. 20, ON THE EDGES.



FIG. 22.—E 12 PLATE V, SLIGHTLY RESTORED.

Step G has one and a half glyphs missing from the left end, and nearly three from the right; otherwise it is complete. Compare G 2 with E 4, G 3 with E 5, G 5 with E 11 *a*, G 11 *a* with E 11 *b* and with Plate VI, K 3 *a*.

In G 11 *b*—12 is another distance number. The Kin number in 11 *b* is 0, but the numerals with the other period glyphs are not legible. Compare G 13 *a* with E 13 *a*, F 1 *b* and Plate VI, K 5 *a*. G 13 *b* is a day sign, and G 14 is the month Tzec, having in front of it two curves and the number 8 or else 13. It may be that the two curves form part of the month numeral.

On step J 12–13–14 appears a figure similar to that on D 4–5–6. The attitude as regards the hands and head especially, in this figure suggests a person swimming, but it is doubtful whether this is the idea that it is intended to express.

The numbering on the top of the plate applies down to and includes step K. After that the glyphs are closer together, and the last two steps on the plate have twenty glyphs on each, the same as those on Plate VI.

On Plate XII are shown a number of disconnected blocks reproduced from photo-

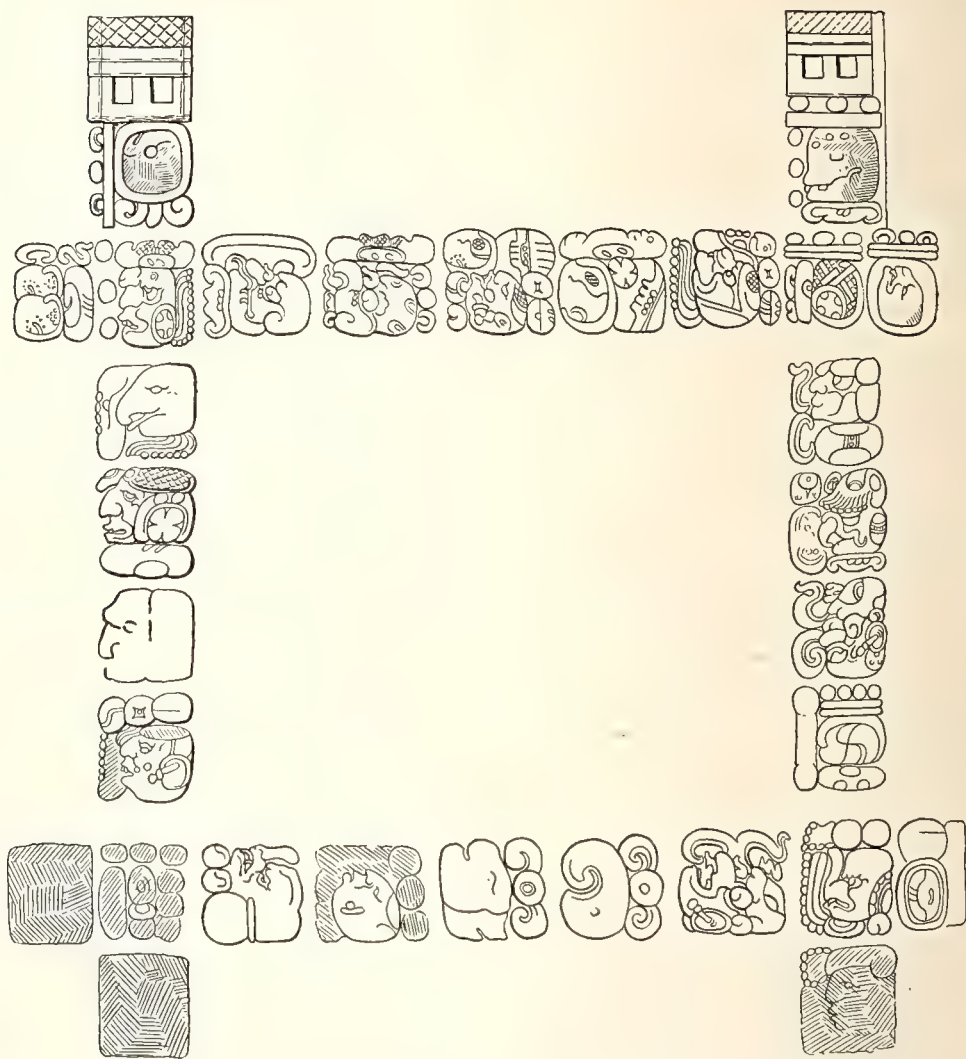


FIG. 23. — HIEROGLYPHIC BANDS AT THE BASE OF STELA N.

graphs of the originals. These blocks contain a number of glyphs in varying degrees of preservation, and each of these fragments fills a gap somewhere in the inscription, but there are much longer gaps which cannot be filled. It will be seen that in several places two or more blocks are photographed together, giving a sequence of several glyphs.

In E 1st fragment, there are three blocks forming a sequence. The first contains just two complete glyphs. The second contains a prone figure, and the third, the beginning glyph already mentioned. It is very doubtful whether the first of these blocks bears the relation to the next one that is indicated in the photograph. The joint falls on a plain surface, and there is nothing to indicate such a relationship. The other joint falls on the sculpture, and there is no question about it. The last

block was found resting on the slope higher up than the highest step shown on Plate V, showing that the initial date of which E 4 was the beginning glyph preceded the date on step D, Plate V in position. E 1^a is recognized as the beginning or left end of a step by the character of the sculpture.

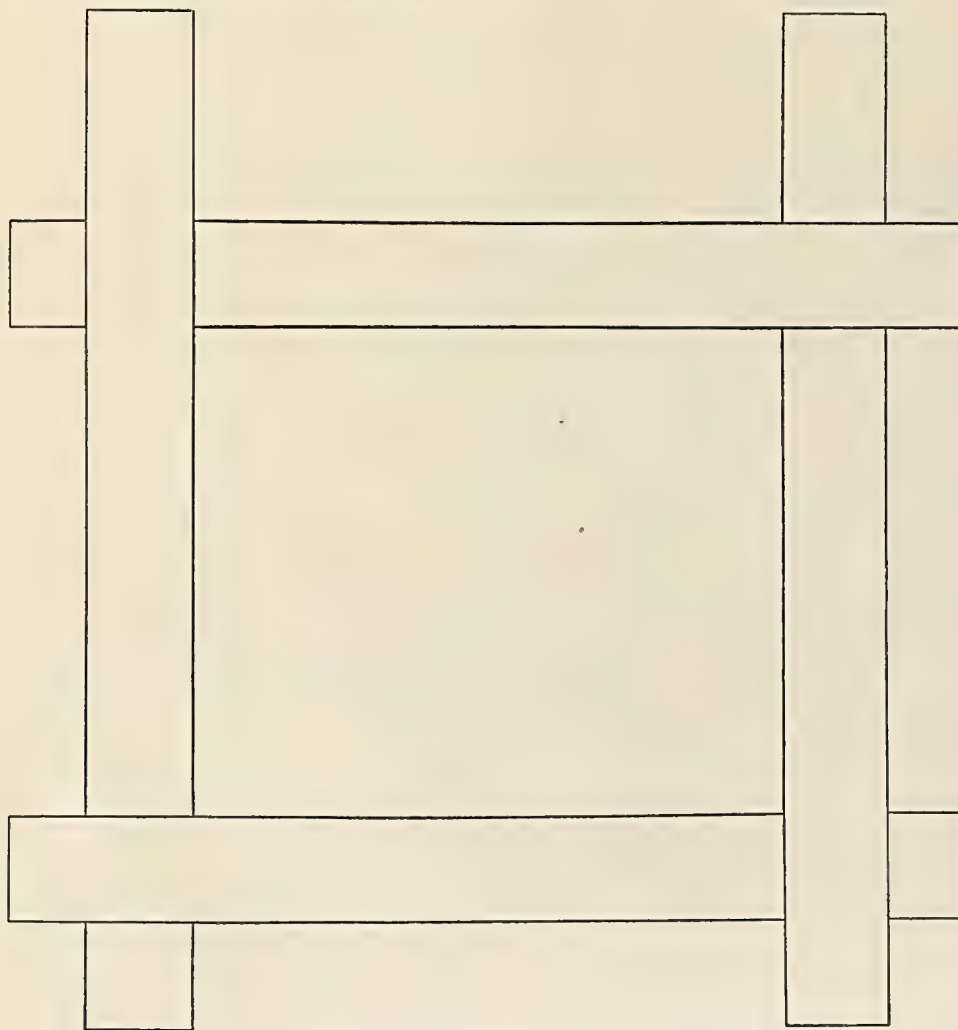


FIG. 24. — PLAN OF HIEROGLYPHIC BANDS AT THE BASE OF STELA N.

E 1 is evidently 3 Yaxkin. A day glyph must have been on the preceding step near or at the right end, and was probably preceded by either a distance number or an initial series.

F 1 is also recognized as the beginning of a step. Compare F 1 *a* with Plate V, E 11 *b*, and G 11 *a*, also with Plate VI, K 3 *a*. F 1 *b* - 2 is a distance number made up of 6 Kins, 14 Uinals, and 11 Tuns. F 3 *b* is 11 or 13 Ahau, F 4 *b* is 8 Cimi (?), and F 5 may prove to be 14 Tzec. On the third block in the same line appears another number consisting of 19 Kins and 1 Uinal.

In H there is a joint between the second and third glyphs, and another in the middle of the fourth glyph. The restoration is probably correct in both instances.

In I are three restorations, one joint coming in the middle of the second glyph and one in the middle of the third. The other comes in the eighth glyph, this being the extreme right-end glyph on a step. The number expressed in glyphs 7 and 8 is 6.18.18.

In J there is one restoration in the fourth glyph, and in K there is one in the second glyph. J 4 *a* is 6 Cimi, and K 1 is ? Chicchan, in all probability, as has already been intimated. It is quite likely that there was an initial series made up of glyphs of the same character as those in K 1, 2, 3, 4, 5, and it is not unlikely that O 6 is the Tun glyph belonging to this series, and O 7, of which only a fragment remains, the Uinal glyph. K 1 would be the day glyph, and the month glyph would come after a series of supplementary glyphs.

In R can be seen the beginnings of four initial dates.

On Plate XIII are additional fragments of the inscription. The fragment P seems to be a part of an initial date, and to read, 9th Cycle, 14th Katun. N is another fragment, possibly of the same initial date, although the block in N is somewhat thicker than that in P, and has a border along the bottom, which is wanting in the other fragment. As all of the steps found in position have this border at the bottom, it is conceivable that in fragments where it is absent it had been supplied by a thin slab of stone placed beneath, and this would make the fragment in P the same thickness as that in N. Since the plates were made I have discovered that the fragment shown on Plate XII, D, last fragment, should follow N on Plate XIII, giving the Kin sign, as shown in the drawing, Fig. 25, and the sequence reads: ? Tuns, 16 Uinals, and 5 Kins. If the fragment P belongs to the same sequence, we would have

9.14.?.16.5.

The fragment D has a number as follows: ? Kins, ? Uinals, 15 Tuns, and 1 Katun. In the third glyph is seen the symbol which Förstemann and others have called the Venus sign. Here it is enclosed in a cartouche and is accompanied by the number 7. It has the characteristics of a day sign, although the support underneath differs from that commonly associated with the day signs. It is probably 7 Lamat. Compare the head which precedes it with the heads preceding day signs on Plates V and VI, already pointed out.

In J is seen the date 8 Oc or Chicchan 3? There is little doubt the day is Oc and not Chicchan. It should be mentioned that some of the fragments on this plate are shown on a somewhat smaller scale than others.

On the fragment Q appears ? Ahau 18 Tzec.

It will readily be seen, by the foregoing inspection of the glyphs, that this inscription contains considerable chronological matter of some sort, embracing long periods of time; how many years we are not able to say because many of the dates are lost. Leaving aside all dates except those in that part of the stairway still in position, the lower part, which according to our estimates is not more than one-sixth of the whole inscription, there occur four initial dates in progressive chronological order, just as dates would occur in an historical record. According to the interpretations set down in these pages the second of these dates differs from the first by $2.18.12.5 = 17,525 = 48$ years and 5 days (allowing 365 days to the year). The third date differs from the first by $3.15.5.4 = 27,104 = 74$ years and 94 days. The third and last of these dates differs from the first by $2.7.10.2.9 = 342,049 = 937$ years and 44 days.

Whether or not the initial dates in the preceding portions of the inscription led up in regular chronological order to the first of these (Date I), it seems impossible at present to determine with anything like assurance.

If by any chance this should prove to be the case, it is not inconceivable that the retrospect may have extended to an era as remote as that apparently denoted by Date VI in any one of the three earlier of the five readings given on page 32, an era which, however imaginary in its scenery, is well within the bounds contemplated by the time count and in every way consistent with the scope of the calendar in use among the Mayas.



FIG. 25.

How near the beginning of the inscription Date VI was, it is not possible to say, but the great quantity of sculptures found *underneath* the landslip would seem to indicate that the part of the inscription where it occurs was well up towards the top of the stairway. The reasons have already been given for believing the date which presumably followed the "beginning glyph," on Plate XII, E 4 (Date V) to have preceded Date VI in position.

Each of the long inscriptions at Copan, and elsewhere, whether on stela, altar, temple walls, or steps, begins with an initial date which is regarded as the date on which the corresponding monument was erected or dedicated. It is impossible to tell whether the inscription on the Hieroglyphic Stairway began in the same way or not, but according to the same theory it may be inferred that the concluding date is the one that refers to the stairway itself, the date on which some ceremony connected with its completion or possibly the inauguration of the work was performed.

This makes the stairway, with one probable exception, the latest monumental work at Copan, which is not surprising, for the elaborate architecture, the evolution of the ornament, the finish of the sculpture, and the highly artistic quality of the glyphs, all seem to argue an advanced state of development. It may be a matter for some surprise that it should be separated from all the other monuments with known dates by so great a period of years. The next latest date is that on Stela N, which reads 54.9.16.10.0.0, and is therefore 730 years earlier than Date IV, or, to be exact, 266,329 days. The probable exception referred to is Stela C, Copan, which has on the south side an inscription having a date which would seem to be not far removed from Date IV, and it is not unlikely that when the dates on Stela C are understood, this monument will be found to belong to the same period as the Hieroglyphic Stairway. The two monuments have certain technical affinities in the carving, as though they might have been the work of the same master.

Next to Stela N the latest date is that on Stela M, which is 54.9.16.8.0.0, making the stela about 5 years older than Stela N. From its association with the stairway, one would be led to suppose that this stela belonged to the same period, but it appears otherwise. It would seem to have stood in front of the older edifice, that served at last as a foundation for the Hieroglyphic Stairway with its temple, for centuries before the latter was built.

The centre of the stairway was located with special reference to the position of Stela M, but this may have been for architectural effect entirely, or with this end in view, Stela M may have been moved at the time the stairway was built. Anyway, it is not necessary to suppose that the erection of the one had anything to do with that of the other. What we must suppose is that a long period of comparative inactivity elapsed between the setting up of Stelæ M and N on the one hand, and the erection of the Stairway and (presumably) Stela C on the other hand.

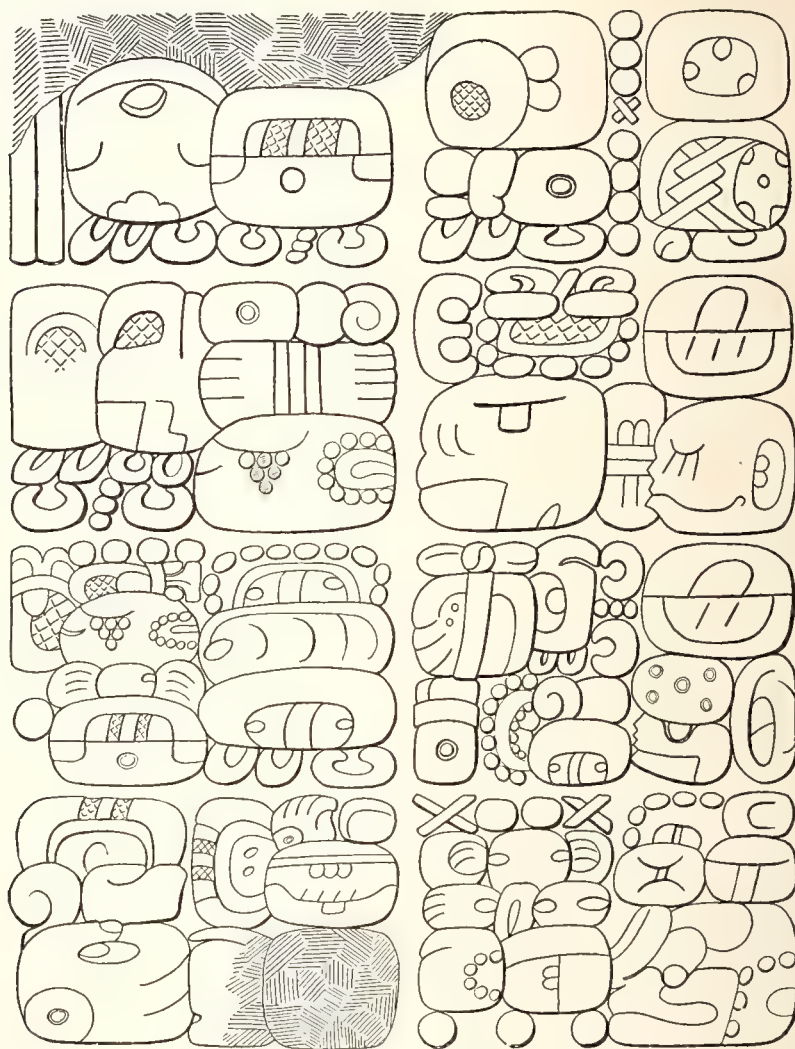


FIG. 26. — INSCRIPTION ON A SMALL STONE PILLAR FROM COPAN.

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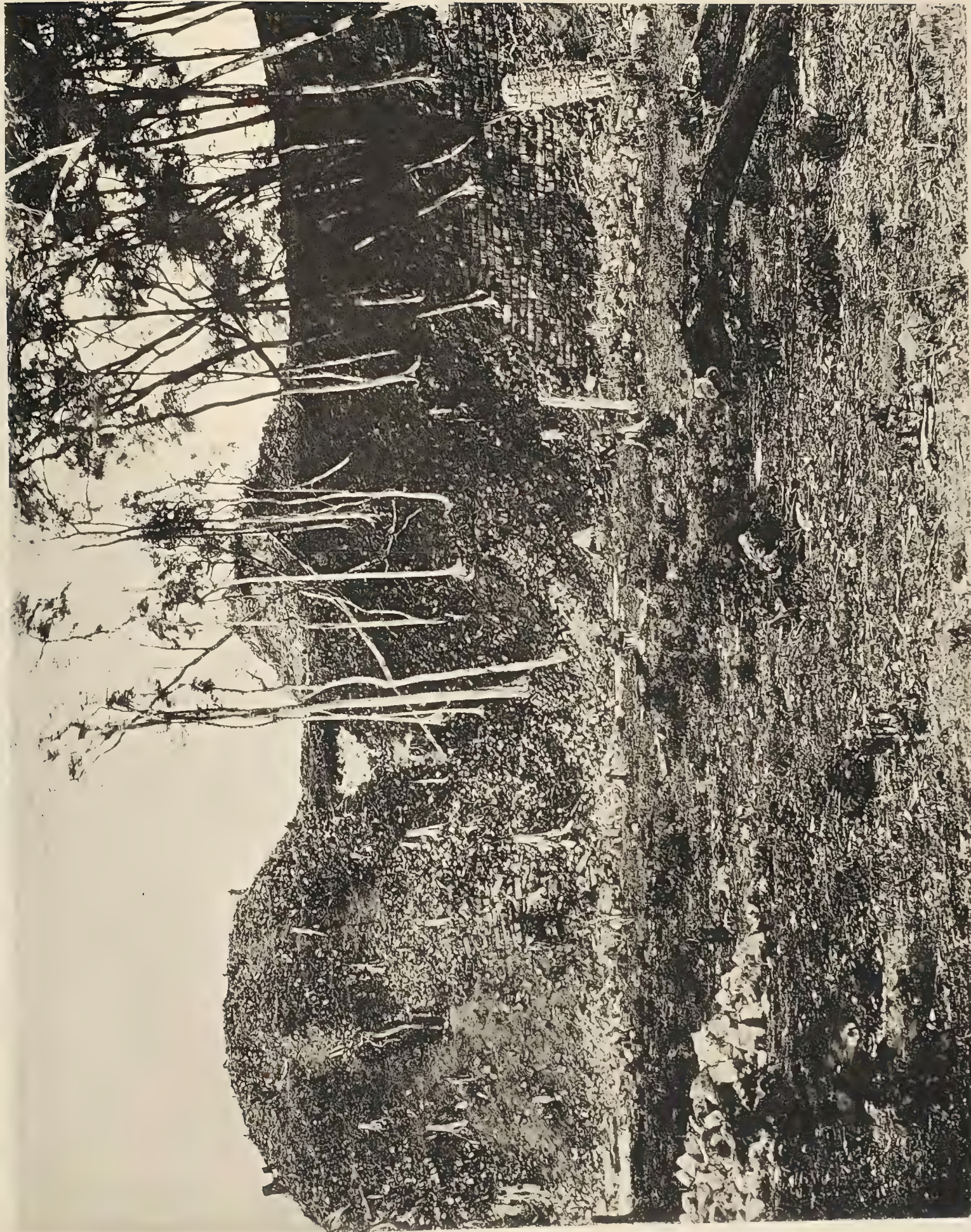
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ERRATA.

- Comatan, read Camotan (see Index)
- Chemilicon, read Chamelicon (see Index)
- Yohoa, read Yojoa (see Index)
- Page 184, 4th line from bottom of page, for 18, read 8
- Page 184, 2d line from bottom of page, second word, for third, read fourth





HIEROGLYPHIC
STAIRWAY.

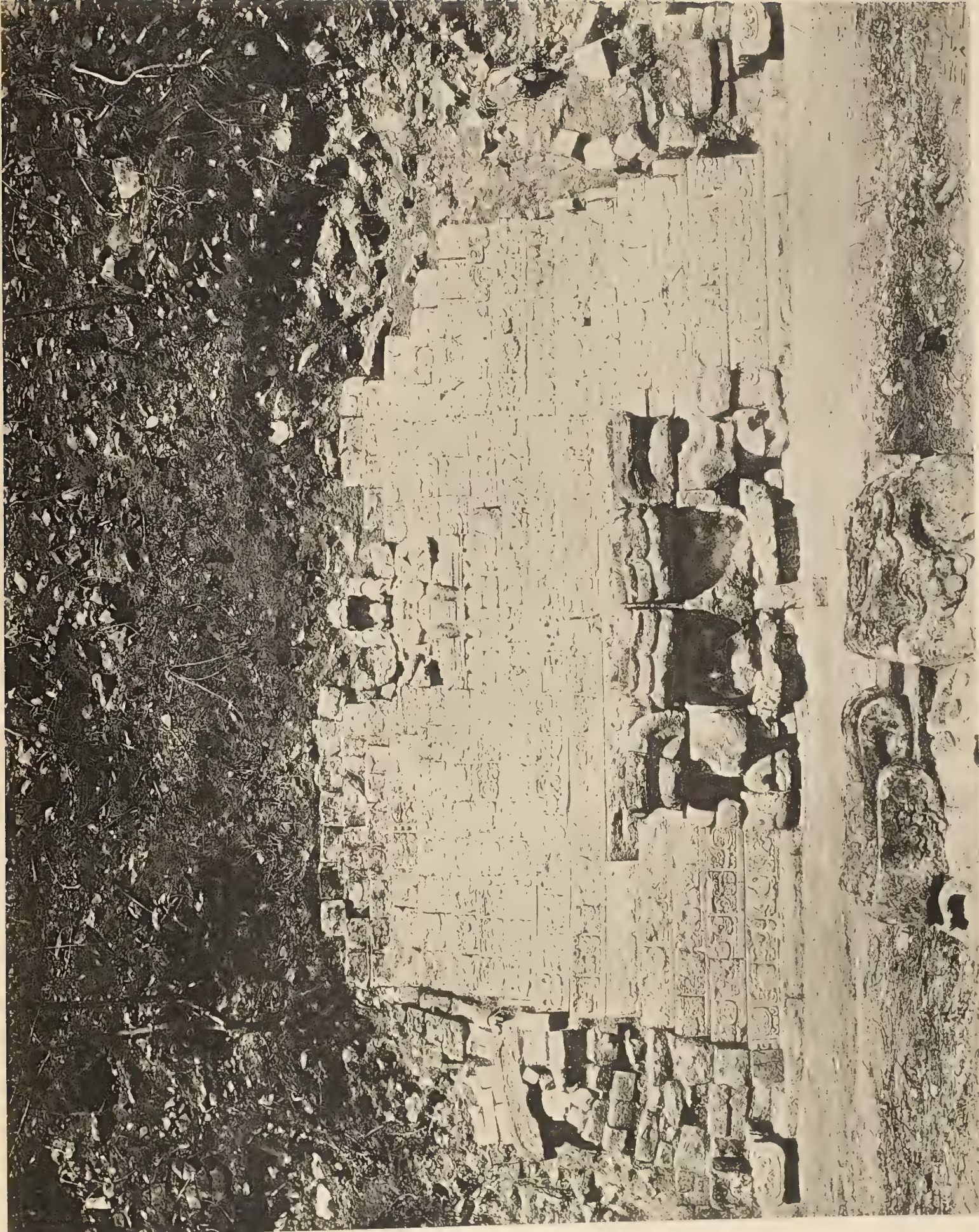
STELA N.

MOUND 26 AND ADJOINING PART OF MAIN STRUCTURE SHOWING SITE OF HIEROGLYPHIC STAIRWAY BEFORE EXCAVATION.

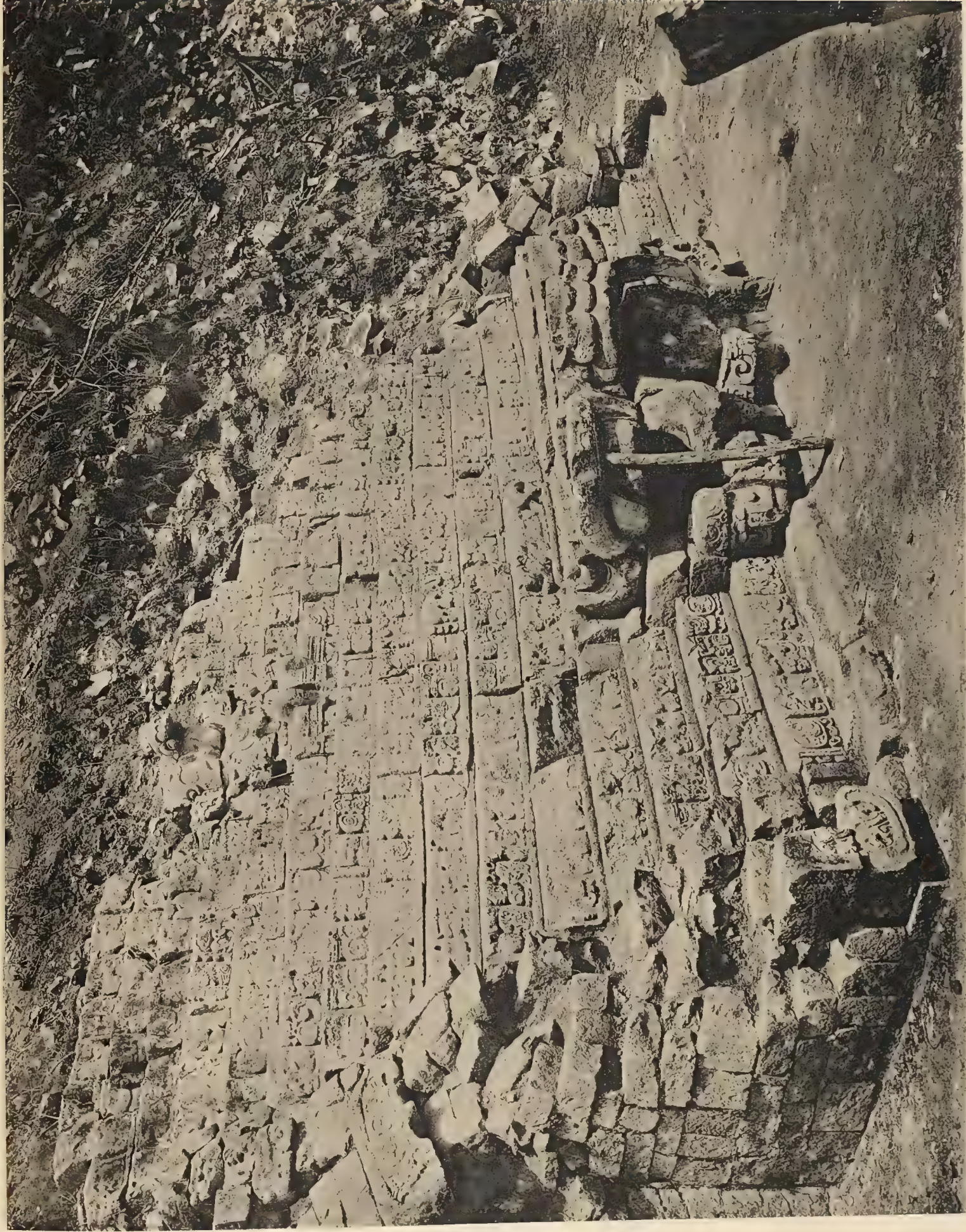




REMOVING THE FALLEN STEPS.



HIEROGLYPHIC STAIRWAY AFTER EXCAVATION.



HIEROGLYPHIC STAIRWAY AFTER EXCAVATION.



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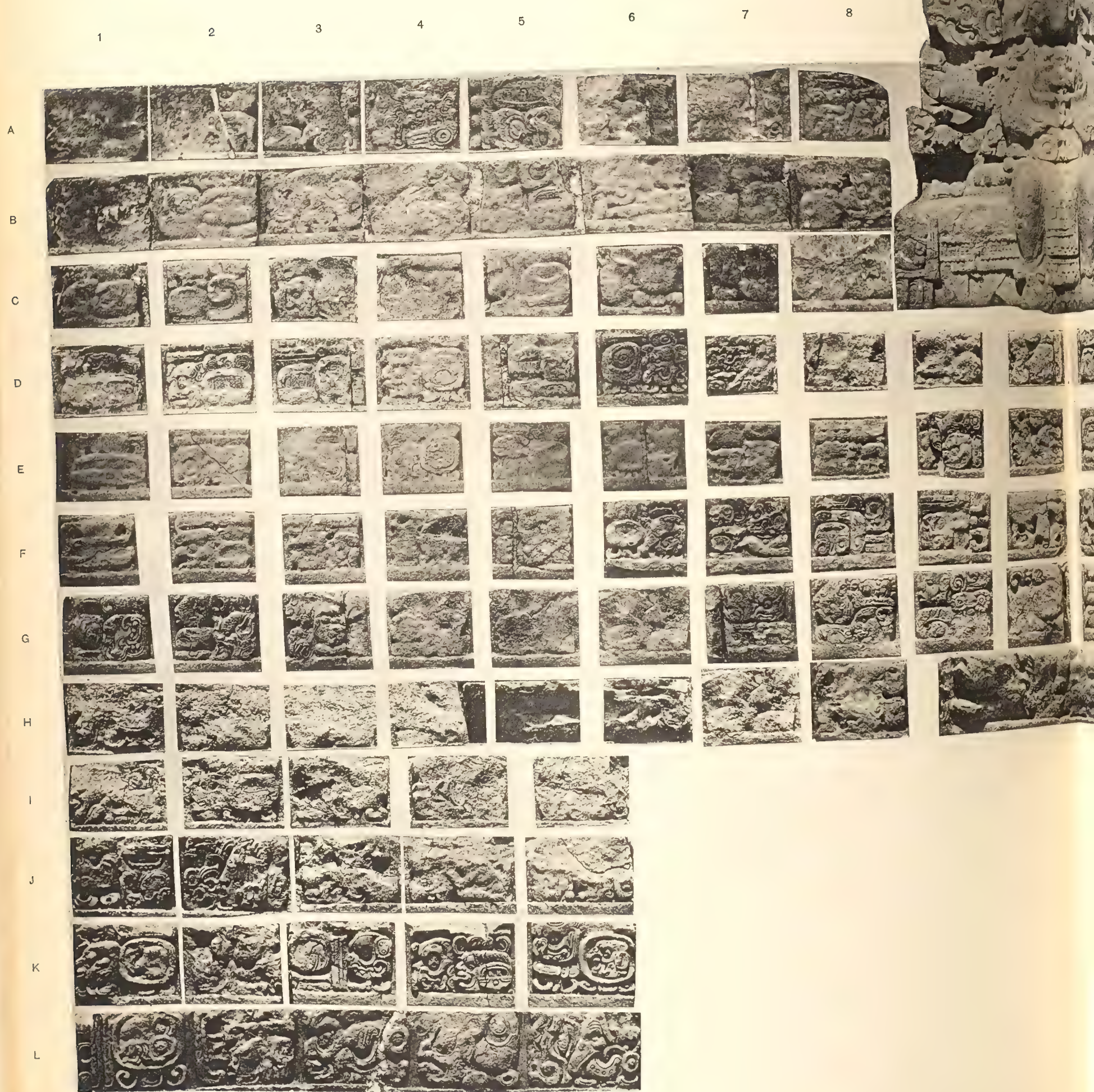
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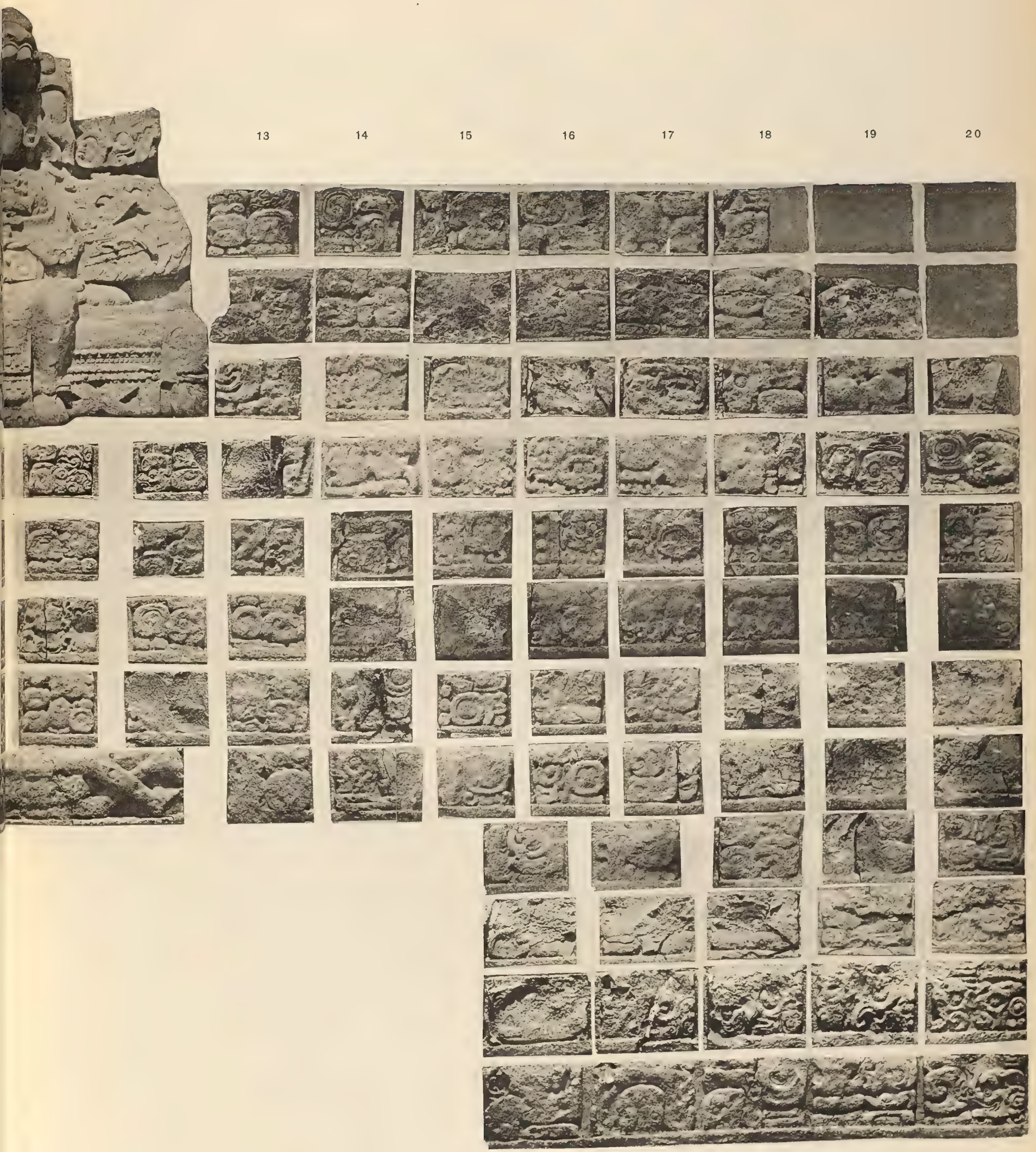
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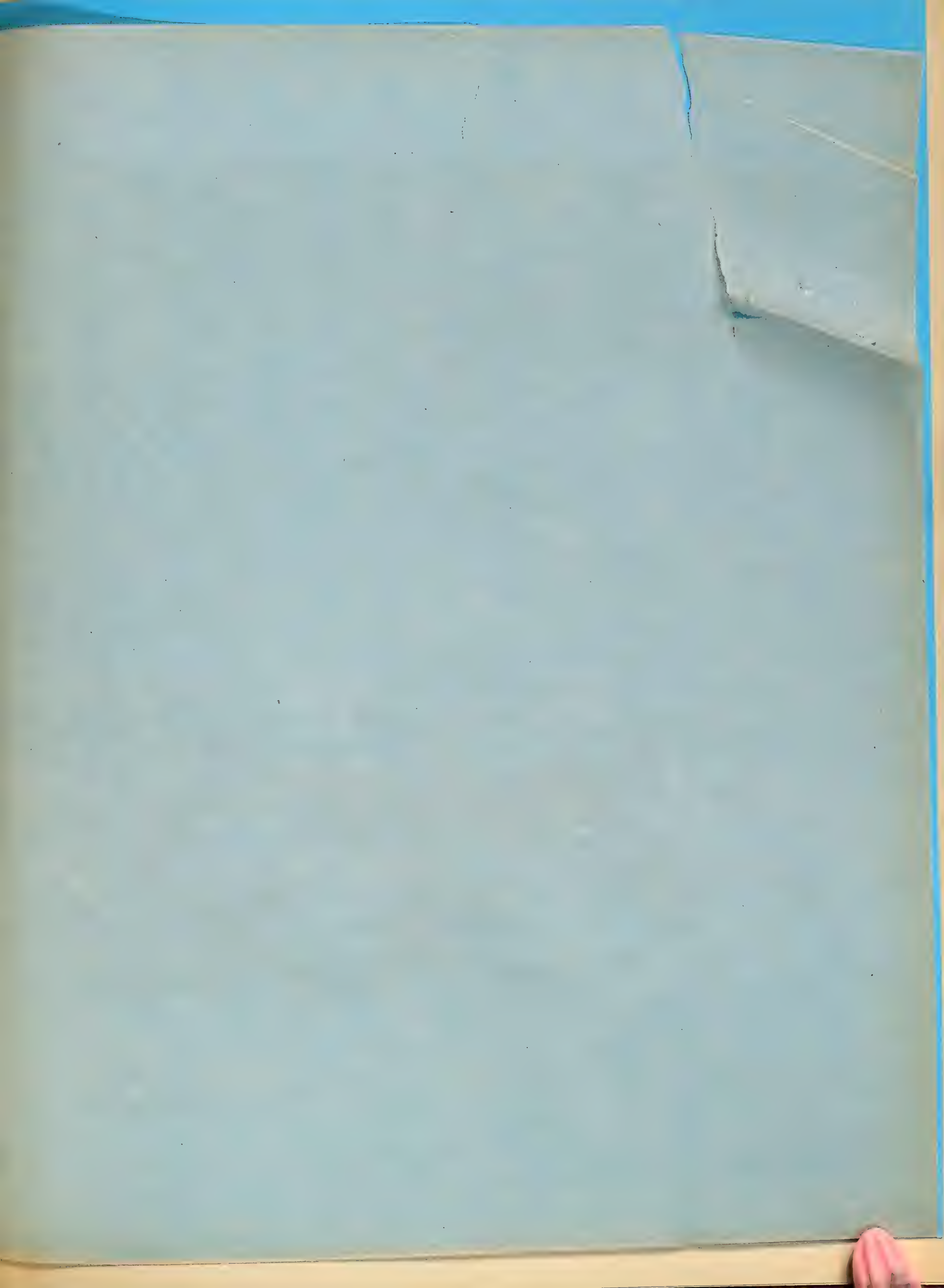




HELIO TYPE CO., BOSTON.

STEPS IN







MIDDLE SECTION OF LOWER PORTION OF STAIRWAY, SHOWING ALTAR
AT BASE AND SEATED FIGURE ABOVE.



ALTAR AT BASE OF STAIRWAY.



1



2

DETAILS OF ALTAR AT BASE OF STAIRWAY.

1 SOUTHERN HALF.

2 NORTHERN HALF.

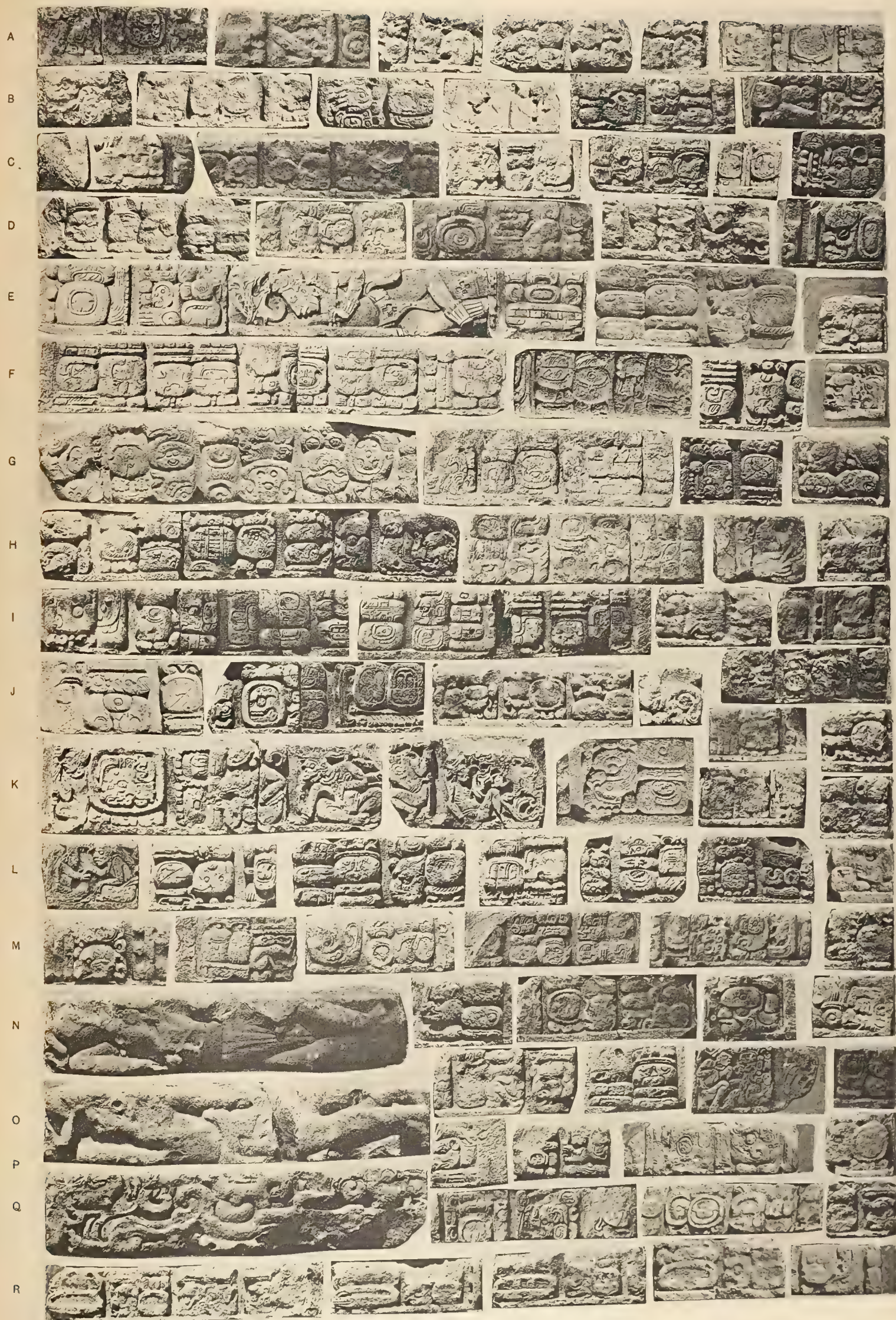




SEATED FIGURE ABOVE THE ALTAR.



TOP OF ALTAR AT BASE OF STAIRWAY.



DISCONNECTED FRAGMENTS OF THE INSCRIPTION.

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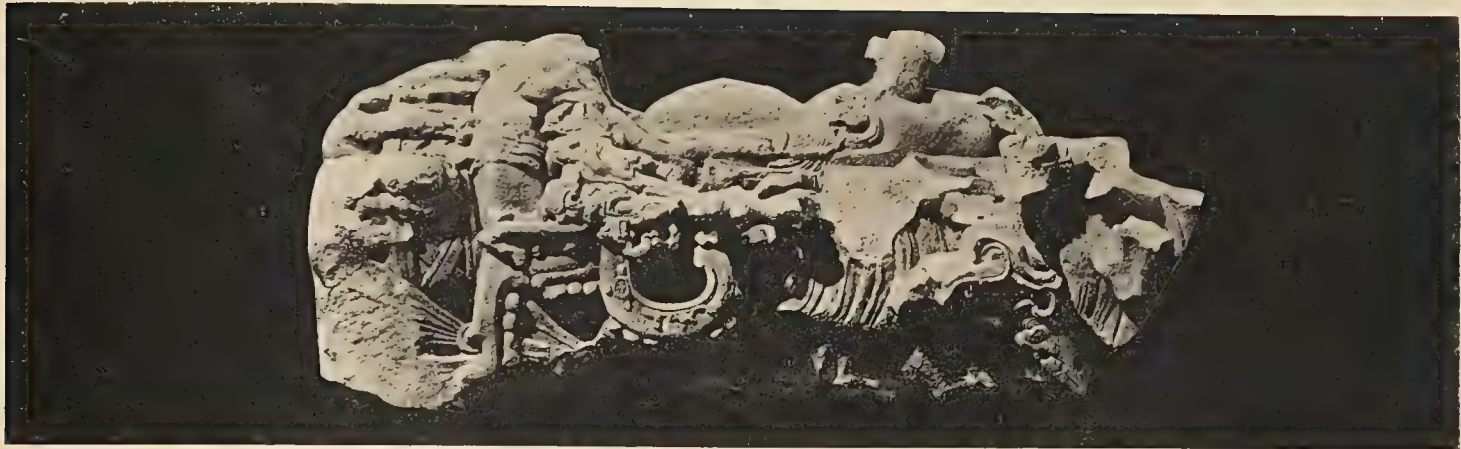
FRAGMENTS OF THE INSCRIPTION AND OTHER SCULPTURES FROM THE STAIRWAY.



ONE OF THE SEATED FIGURES FROM CENTRE OF STAIRWAY.



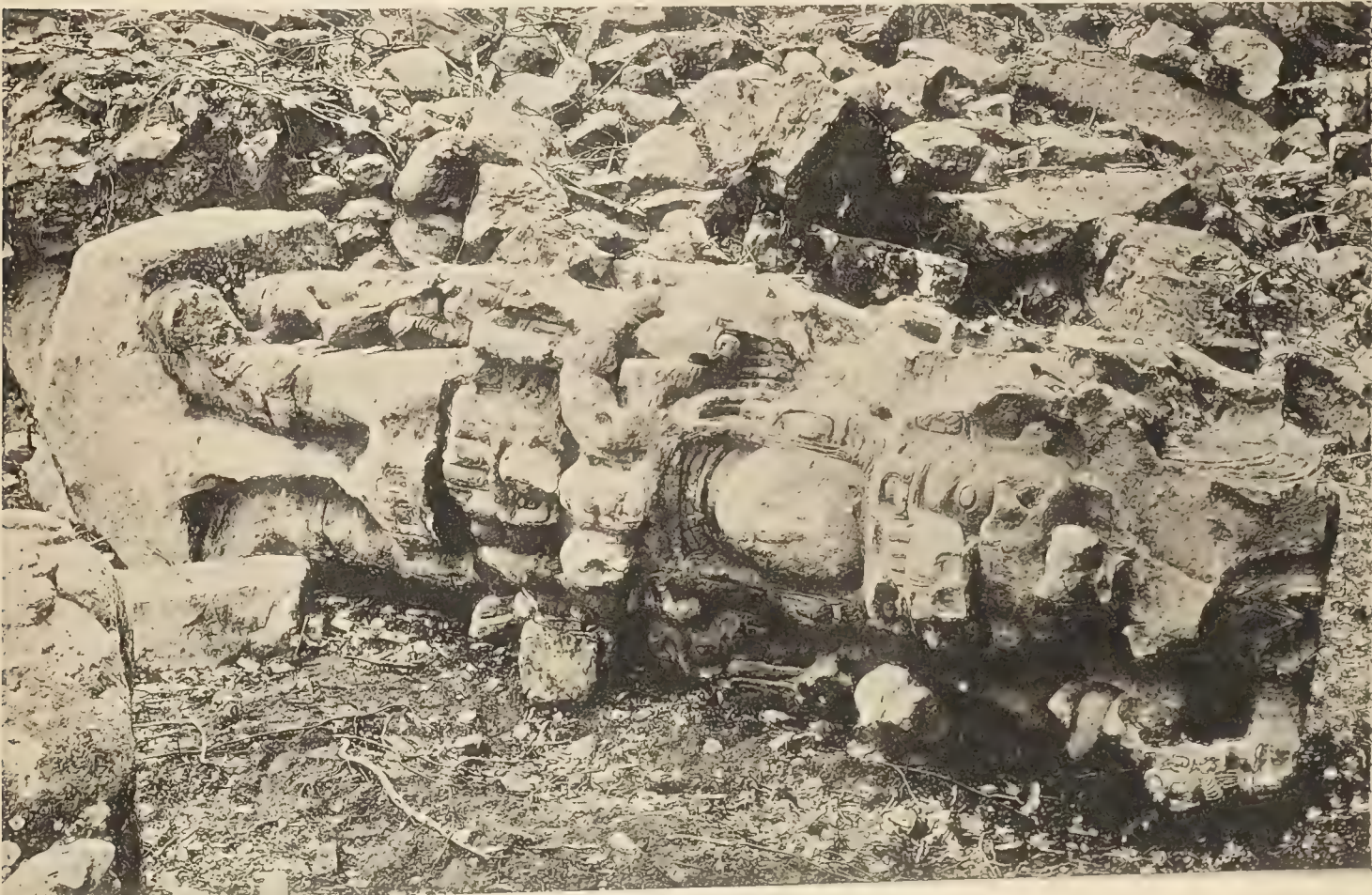
SCULPTURES FROM HIEROGLYPHIC STAIRWAY.



1



2



3

STELA M.

1 UPPER PORTION OF STELA, SIDE VIEW. 2 BACK OF STELA. 3 FRONT OF STELA.



1



2



3



4



5

ALTAR OF STELA M.

- 1 NORTH HEAD, SIDE VIEW. 2 NORTH HEAD, FRONT VIEW. 3 SOUTH END OF ALTAR WITH HEAD IN PLACE.
4 NORTH END OF ALTAR WITH HEAD IN PLACE. 5 VIEW OF ALTAR LOOKING SOUTHEAST.



MOUND 26 AFTER EXCAVATION OF STAIRWAY. SCULPTURES FROM DÉBRIS OF STAIRWAY IN FOREGROUND.

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Cave of Loltu can over



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